

Volume 20

Pages 3442 - 3716

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

BEFORE THE HONORABLE WILLIAM H. ALSUP

ORACLE AMERICA, INC.,)	
)	
Plaintiff,)	
)	
VS.)	No. C 10-3561 WHA
)	
GOOGLE, INC.,)	
)	
Defendant.)	San Francisco, California
)	May 10, 2012

TRANSCRIPT OF JURY TRIAL PROCEEDINGS

APPEARANCES:

For Plaintiff:

MORRISON & FOERSTER
755 Page Mill Road
Palo Alto, California 94304

BY: MICHAEL A. JACOBS, ESQUIRE
KENNETH A. KUWAYTI, ESQUIRE
MARC DAVID PETERS, ESQUIRE
DANIEL P. MUINO, ESQUIRE

BOIES, SCHILLER & FLEXNER
333 Main Street
Armonk, New York 10504

BY: DAVID BOIES, ESQUIRE
ALANNA RUTHERFORD, ESQUIRE

(Appearances continued on next page)

Reported By: Katherine Powell Sullivan, RPR, CRR, CSR #5812
Debra L. Pas, RMR, CRR, CSR #11916
Official Reporters - U.S. District Court

Katherine Powell Sullivan, CSR, CRR, RPR
Debra L. Pas, CSR, CRR, RMR
Official Reporters - US District Court - 415-794-6659

APPEARANCES (CONTINUED):

For Plaintiff:

BOIES, SCHILLER & FLEXNER
1999 Harrison Street, Suite 900
Oakland, California 94612

**BY: WILLIAM FRED NORTON, ESQUIRE
STEVEN C. HOLTZMAN, ESQUIRE**

ORACLE AMERICA, INC.
500 Oracle Parkway
Redwood Shores, California 94065

**BY: ANDREW C. TEMKIN, CORPORATE COUNSEL
DORIAN DALEY, GENERAL COUNSEL**

For Defendant:

KEKER & VAN NEST
633 Battery Street
San Francisco, California 94111-1809

**BY: ROBERT ADDY VAN NEST, ESQUIRE
MATTHIAS ANDREAS KAMBER, ESQUIRE
EUGENE MORRIS PAIGE, ESQUIRE
CHRISTA MARTINE ANDERSON, ESQUIRE
MICHAEL S. KWUN, ESQUIRE**

KING & SPALDING LLP
1185 Avenue of the Americas
New York, New York 10036-4003

**BY: BRUCE W. BABER, ESQUIRE
SCOTT T. WEINGAERTNER, ESQUIRE**

GOOGLE, INC.
1600 Amphitheatre Parkway
Mountain View, California 94043

BY: RENNY HWANG, LITIGATION COUNSEL

Also Present:

SAFRA CATZ, President and CFO
Oracle Corporate Representative

CATHERINE LACAVERA
Google Corporate Representative

P R O C E E D I N G S

MAY 10, 2012

7:31 a.m.

(The following proceedings were held in open court,
outside the presence of the jury.)

THE COURT: Welcome. Please be seated.

MR. VAN NEST: Good morning, Your Honor.

THE COURT: Good morning.

THE COURT: How can I help you this morning?

MR. JACOBS: We don't have anything, except the
report that we are still working on some of the technical
questions you posed to us yesterday. Both sides got in the
edits to the --

THE COURT: I've gone through those.

MR. JACOBS: And you had a couple of questions that
you put on the record, that we're working on.

THE COURT: Remind me what those were.

MR. JACOBS: I'm sorry?

THE COURT: Was that the chart that had the --

MR. JACOBS: Yes, exactly. And I think you also
asked about -- the chart that shows -- the multi-column chart
that you asked us for.

THE COURT: I remember it now, yes. And?

MR. VAN NEST: And a couple of things, Your Honor.

I would like to hand up a depo, video depo

1 designation for Mr. Gupta. There's a few objections that Your
2 Honor needs to resolve. We won't get to it today, but we'd
3 like to play it tomorrow, in due course.

4 **THE COURT:** Fine.

5 **MR. VAN NEST:** Another housekeeping item.

6 With respect to the patent phase and JMOLs, I was
7 wondering if the court would allow us to use the same procedure
8 we did in Phase One.

9 By that I mean kind of a short, written outline,
10 Monday morning, before the case goes to the jury, and then file
11 a brief on Wednesday, which is kind of like what we did --

12 **THE COURT:** Well, you do need, at the end of the
13 plaintiff's case, to make the motion sufficiently to alert them
14 to any gap in their proof. That is one of the purposes of the
15 Rule 50 motion.

16 It doesn't have to be in writing. It has to be
17 enough that they can understand what you're getting at. But,
18 otherwise, I'm okay with your proposal.

19 **MR. VAN NEST:** And would that work out if we gave you
20 the outline Monday morning, and then filed the brief, say,
21 Wednesday, around noon?

22 **THE COURT:** Well, so long as you make the motion at
23 the end of the plaintiff's case. Or, once you do it they can
24 reopen.

25 **MR. VAN NEST:** Right.

1 **THE COURT:** If you did it on Monday, I guess then
2 they would have to be able to reopen to meet your objections.

3 **MR. VAN NEST:** I was really focused on the final. In
4 other words -- I understand that if there are gaps, we need to
5 make that earlier.

6 But in terms of the JMOL, that has to be due before
7 the case goes to the jury. We would propose to file that
8 Monday morning, and then file our brief Wednesday noon, if
9 that's okay with Your Honor.

10 **THE COURT:** All right. That's good.

11 **MR. VAN NEST:** Then we have some exhibits we want to
12 move in, as well, this morning.

13 **THE COURT:** Okay.

14 **MR. KAMBER:** Your Honor, this is associated with the
15 depo designations for Mr. Gupta, that Mr. Van Nest just handed
16 you. We've agreed with Oracle to put in the following
17 documents: TX 128. 139. 201. 206. 208.

18 **MR. JACOBS:** No objection.

19 **THE COURT:** All received in evidence.

20 (Trial Exhibits 128, 139, 201, 206, and 208 received
21 in evidence.)

22 **MR. KAMBER:** 530. 531. 537. 582. 1058.

23 **MR. JACOBS:** No objection.

24 **THE COURT:** Thank you. All received.
25

1 (Trial Exhibits 530, 531, 537, 582, and 1058 received
2 in evidence.)

3 **MR. KAMBER:** 2078. 2081. 2308. 3137.

4 **MR. JACOBS:** No objection.

5 **THE COURT:** Received.

6 (Trial Exhibits 2078, 2081, 2308, and 3137 received
7 in evidence.)

8 **MR. KAMBER:** 3138.

9 **THE COURT:** 3138.

10 **MR. KAMBER:** 3153 and 3154.

11 **MR. JACOBS:** No objection.

12 **THE COURT:** All received.

13 (Trial Exhibits 3138, 3153, and 3154 received in
14 evidence.)

15 **MR. KAMBER:** Thank you, Your Honor.

16 **THE COURT:** Okay.

17 **MR. BABER:** Your Honor, just as a footnote to what
18 Mr. Jacobs said. Last night, when we filed our comments on
19 your draft --

20 **THE COURT:** Got those.

21 **MR. BABER:** -- we said we would be prepared to
22 discuss theirs whenever Your Honor is ready. Just had a few --

23 **THE COURT:** I left it in the other room, but what is
24 your problem?

25 **MR. BABER:** No problems, Your Honor. We're generally

1 okay with what they proposed, as well, but there are some typos
2 and just very minor cleanup things.

3 **THE COURT:** Typos in theirs or typos in mine?

4 **MR. BABER:** Typos in theirs, Your Honor.

5 **THE COURT:** You did get some of my typos, and I
6 appreciate that, of course.

7 Can you do this, can you hand a copy to both sides
8 and I'll consider it. It is such a detailed thing that it's
9 better to do it when I can lay it all out on the desk and look
10 at it.

11 **MR. BABER:** I will be happy to do that, Your Honor,
12 by the first break or second break.

13 **THE COURT:** Great. Thanks.

14 And?

15 **MR. NORTON:** Your Honor, we filed last night -- and
16 Google responded to it -- a motion in limine with respect to
17 documents and testimony that Google apparently intends to
18 elicit from two witnesses, Mr. Hinkmond Wong, an Oracle
19 employee and engineer, and Mr. Noel Poore, another Oracle
20 employee and engineer who has testified. But Google would like
21 them to testify in their case, as well.

22 Mr. Wong may well get on the stand today. Mr. Poore
23 is not well today, and Google has agreed that he can return
24 tomorrow.

25 But the issue here is -- and we've set out the

1 particular documents in our motion, but we're about -- little
2 bit short of 30 documents disclosed for Mr. Wong. A subset of
3 those and a few others disclosed for Mr. Poore.

4 And many of these documents don't seem to have any
5 relevance to anything in Phase Two or perhaps in the case at
6 all. A number of them appear to be relevant -- many of them
7 appear to be relevant only to damages issues.

8 Commentary on the Java ME business model, commentary
9 on Sun's Java ME strategy. There's documents that go all the
10 way back to 2003 --

11 **THE COURT:** Give me a couple -- I saw your motion,
12 but without seeing the exhibits I have no way to evaluate it.

13 **MR. NORTON:** Sure.

14 **THE COURT:** So if you'll hand up to me -- give me one
15 of your exhibits that you feel is not appropriate for this
16 phase.

17 **MR. NORTON:** I'll hand up to the Court -- here is a
18 copy for counsel, Exhibit 557.

19 **THE COURT:** This is from someone named Mark Fulks?

20 **MR. NORTON:** Yes, Your Honor.

21 **THE COURT:** To Konstantin Zolotnikov.

22 **MR. NORTON:** So this is an internal Sun e-mail from
23 2006. And Mr. Wong was on an e-mail list server and,
24 therefore, appears to have received the e-mail. And it
25 comments on Sun's perspective on the business negotiations

1 between Oracle and Google back in 2006. And although it is
2 certainly relevant to damages, it is not relevant in any way to
3 Phase Two.

4 The specific --

5 **THE COURT:** So it would be better to hear why it is
6 relevant, and then you can respond.

7 Why is 557 relevant?

8 **MR. WEINGAERTNER:** Good morning, Your Honor.

9 **THE COURT:** Good morning.

10 **MR. WEINGAERTNER:** First of all, I just wanted to
11 mention that we plan to focus on Phase Two issues only. We are
12 not going to get into my equitable issues in front of the jury,
13 respecting Your Honor's point about that. Or in Phase Three.

14 We didn't necessarily feel it was appropriate to make
15 commitments one way or the other on these documents because
16 they relate to Android.

17 And in the case of Mr. Poore, Mr. Poore was put up as
18 somebody to talk about some kind of independent testing of
19 Android. But the fact that he spent time looking at Android
20 issues is potentially relevant for the jury to consider in
21 terms of his credibility.

22 As to Mr. Wong, what we're trying to go after, Your
23 Honor, to be clear -- and I don't think it's going to be a very
24 long examination -- is, he's made public comment. He's
25 compared Android and Java. He's got a basis for having done

1 that based upon his work looking at Android --

2 **THE COURT:** Slow down.

3 **MR. WEINGAERTNER:** Sorry. From New York.

4 And the fact that he spent time looking at Android
5 and looking at -- closely at Java, which is what he spent his
6 career, apparently, doing, is relevant to the -- some of the
7 positions he's taken. And that's what we're going to focus on,
8 Your Honor.

9 **THE COURT:** Mr. Wong, has he showed up and testified
10 yet?

11 **MR. WEINGAERTNER:** No. No, he has testified in
12 deposition but not yet at trial.

13 By the way, these are all -- almost all these, I
14 think, are in evidence already, Your Honor.

15 **THE COURT:** Does Mr. Wong's work somehow support --
16 is Oracle relying on Mr. Wong's work directly or indirectly?

17 **MR. WEINGAERTNER:** Well, yes. I mean, he has played
18 a role in examining -- from what we can tell based upon
19 non-privileged comments he has made in his deposition, that he
20 spent a lot of time looking at the patents or looking at Sun
21 patents and looking at Android, and has made public comments on
22 distinctions between Android and Java.

23 **THE COURT:** Give me one example that would help --
24 explain to me why this goes to non-infringement.

25 **MR. WEINGAERTNER:** Well, he has made -- publicly

1 described how Android and Java are different, the Java ME and
2 the Dalvik ME are different from each other.

3 And we've heard a lot of testimony about how they are
4 the same and there's infringement. And the fact --

5 **THE COURT:** Only the same insofar as the patent
6 claims are concerned. They can be, otherwise, dramatically
7 different. But if they cover the same -- if both of them
8 overlap even a tiny bit on the patent, then the fact that they
9 are different in other ways doesn't excuse infringement.

10 **MR. WEINGAERTNER:** We aren't saying it excuses
11 infringement. We think it's probative of it, as other things
12 are.

13 **THE COURT:** Tell me what you're talking about here.

14 **MR. WEINGAERTNER:** Okay.

15 **THE COURT:** Show me what in this document can -- goes
16 directly to one of these infringement issues.

17 **MR. NORTON:** Mr. Weingaertner, I've got a copy.

18 **MR. WEINGAERTNER:** You do?

19 **THE COURT:** Let's just stick with 557, for a moment.
20 It's a 3-page, 5-page, looks like, e-mail. So I don't -- so
21 what part of this do you think shows non-infringement?

22 **MR. WEINGAERTNER:** Your Honor, I wasn't planning on
23 relying on this for that point.

24 **THE COURT:** I'm sorry?

25 **MR. WEINGAERTNER:** I wasn't planning on relying on

1 this document for that point.

2 **THE COURT:** What part of 5 -- what part of 557 do you
3 want in evidence?

4 I'm on the verge of throwing it out. You're not
5 answering my question.

6 **MR. WEINGAERTNER:** Your Honor, I really would like --
7 I'm not going to specifically focus on this.

8 **THE COURT:** 557 is out. Give me the next one.

9 **MR. WEINGAERTNER:** Your Honor --

10 **THE COURT:** You're going to have to answer my
11 questions pronto, or you're going to lose on that issue.

12 **MR. WEINGAERTNER:** Your Honor, what I will do is I
13 will -- I'm willing to drop these --

14 **THE COURT:** All right.

15 **MR. WEINGAERTNER:** -- for Mr. Wong.

16 **THE COURT:** All those exhibits are out. Thank you.

17 **MR. WEINGAERTNER:** Thank you, Your Honor.

18 **THE COURT:** Are you dropping the witness, as well? I
19 guess not.

20 **MR. WEINGAERTNER:** No, Your Honor.

21 **THE COURT:** That wasn't part of the motion.

22 **MR. NORTON:** We're not objecting to Mr. Wong getting
23 on the stand at all.

24 **THE COURT:** These exhibits are all history. They are
25 gone. Whatever was in that motion.

1 All right. Thank you.

2 What else do you have?

3 **MR. JACOBS:** Nothing from our side.

4 **THE COURT:** Can we see if the jury is ready?

5 **THE CLERK:** Okay.

6 **THE COURT:** Let's take advantage of the time here,
7 for a second. We can just speak in terms of Phase Three and
8 rangeCheck for a moment.

9 I'm still trying to figure out what to do on the
10 decompiled files. There's no way that -- you have no damage
11 study. You've got nothing.

12 The fact that they had nine lines out of many
13 millions of lines of code that were copied, that is not --
14 there's no way you can -- you have no damage study that is tied
15 into that. No profit infringement study. Nothing like that.

16 So you will have to take an appeal. I'm now talking
17 to Oracle on this.

18 So, at most, you're going to be allowed to ask for
19 statutory damages.

20 **MR. NORTON:** Thank you, Your Honor.

21 **THE COURT:** All right. You can ask for -- that's a
22 jury issue, as I understand it. But it seems to me to be not a
23 good use of the jury's time to -- to argue that one out in
24 front of the jury. The maximum is \$150,000.

25 I think you two ought to -- I'm not ruling this. I'm

1 just saying, I think you ought to consider a way to streamline
2 the trial on that piece of it, and just enter a judgment for
3 some dollar amount on the -- on anything for which there is
4 just statutory damages.

5 But if you won't do that, then it is a jury issue and
6 you get to argue your point in front of the jury.

7 Yes, Mr. Van Nest, what did you want to say?

8 **MR. VAN NEST:** I was just going to say that we're
9 filing our response to that today, at noon. We agree with Your
10 Honor.

11 One of the proposals that they made was that the
12 damages on rangeCheck go to the Court, not to the jury. We're
13 perfectly comfortable with that. That makes a lot of sense.

14 And I think Your Honor's suggestion is well-taken.
15 We can agree on a number and just enter that. If we can't
16 agree, we can give it to Your Honor to give us a number. I
17 don't think that will be a big deal.

18 We were going to take it one step further --

19 **THE COURT:** What's that?

20 **MR. VAN NEST:** -- in our filing at noon. And that
21 was to suggest that we do the same thing on the patent case, if
22 there is a verdict.

23 Remember that with respect to these two patents,
24 there's sort of a small range of damages between the party
25 experts and Dr. Kearl.

1 The '520 is in the neighborhood of \$80,000 total
2 damages. I think that's around --

3 **THE COURT:** What is Oracle's number?

4 **MR. VAN NEST:** I think it's in that same ballpark. I
5 think all three numbers, all three experts are under a hundred
6 grand.

7 On the '104, the range is a little bigger, but the
8 top end of it is below \$4 million.

9 **THE COURT:** Even Oracle's number is below 4 million?

10 **MR. VAN NEST:** Yes. Dr. Cockburn's number is, I
11 think, 3.8 or 3.7.

12 What we were going to suggest in our noon filing, if
13 there's a verdict in Phase Two, that we stipulate to try
14 damages to the court. Or, I think we earlier offered to just
15 agree to Dr. Kearl's number, because I assume if this is tried
16 to Your Honor you'll find Dr. Kearl persuasive to some degree.

17 **THE COURT:** No. Please don't say that. That is
18 bogus. He may or may not. I would have to hear it all out
19 before I would make that conclusion.

20 **MR. VAN NEST:** Fair enough.

21 **THE COURT:** That's not --

22 **MR. VAN NEST:** Fair enough. Fair enough. But my
23 point was that in terms of streamlining this thing, now that we
24 are where we are, and given the sort of range of values that
25 the experts have put up, we thought it made a lot of sense,

1 whether or not we could stipulate on the statutory damages, to
2 put the patent damages to Your Honor as well, and that would
3 save the jury doing Phase Three.

4 **THE COURT:** Well, there's the willfulness part. Now,
5 I -- if you wanted to put the willfulness issue on Phase Two,
6 willfulness could have an impact on the availability of an
7 injunction. That's a possible way that that finding would
8 screw into the overall shape of the case.

9 It's okay with me if you want -- If you both agreed
10 to advance willfulness to Phase Two and excuse the jury for
11 Phase Three, I guess that's okay with me. I'd have to think
12 about that.

13 **MR. VAN NEST:** We'd need to think about that, too,
14 Your Honor.

15 **THE COURT:** But we can't -- you must remember that
16 willfulness part is an important element of this case.

17 You know, it's going to be a little confusing because
18 we're asking the jury to find -- make findings on willfulness
19 for purposes of indirect. Right?

20 **MR. VAN NEST:** Correct. It's not really willfulness,
21 but it's --

22 **THE COURT:** What is it? I thought it was called
23 "willfulness."

24 **MR. VAN NEST:** Well, it's called "willful blindness,"
25 I think.

1 **THE COURT:** All right. So it's slightly --

2 **MR. VAN NEST:** It's a little different.

3 **THE COURT:** It is different, but it could be
4 confusingly similar. And it might be better to have the jury
5 decide all that in one fell swoop.

6 I don't know if that's the way you tried the case.

7 Mr. Jacobs, have you held back other evidence on
8 willfulness, that you're saving for Phase Three, in which case
9 we've got to have Phase Three?

10 **MR. JACOBS:** I think we would have to consider this.

11 Mr. Van Nest is correct that the standard and burden
12 is different for the two. And we would want to make sure we
13 weren't mixing pears and apples here.

14 **THE COURT:** All right. Well, that's a fair point.
15 These are legitimate issues of trial management that I think
16 you should consider.

17 Of course, if you don't come to an agreement, then we
18 just stick with the original plan.

19 **MR. VAN NEST:** Fair enough, Your Honor. I just want
20 to point out --

21 **THE COURT:** I think those are good issues. I don't
22 necessarily say that it's the way to go. But I think both
23 sides have got to try the case in the way they think is best.

24 And you just let me know. If we wind up excusing the
25 jury for Phase Three, I guess that's okay.

1 **MR. VAN NEST:** If we -- the other possibility that we
2 are certainly willing to explore is, if we did reach agreement,
3 which I think we will, on what the statutory damage number is,
4 perhaps we could also reach agreement on what a patent damage
5 number was, too, in the event there were a verdict.

6 We wouldn't need to do that ahead of time. I'm just
7 saying that would be another way to streamline this thing,
8 given the range of values is what it is.

9 **THE COURT:** Let me ask you this. What is -- are we
10 ready?

11 **THE CLERK:** Yes.

12 **THE COURT:** You don't have to answer this unless
13 there's a one-sentence answer, but we can talk about it later.

14 If the jury were to find infringement direct, but no
15 on indirect, how if at all would that affect the damage studies
16 done by the experts?

17 **MR. VAN NEST:** I'd have to take a look at those, Your
18 Honor. Mr. Purcell is the expert on that.

19 **THE COURT:** I don't know. I don't know how that --
20 whether the experts have assumed indirect as well as direct, or
21 whether it doesn't matter.

22 **MR. VAN NEST:** I do know this. It -- I do know this,
23 that the direct infringement numbers are much, much lower
24 because Google really hasn't sold many phones. So the expert
25 reports are based on, in large part, sale of handsets by our

1 partners, not by Google.

2 Google sold some phones early on, as sort of a
3 demonstration project, as you heard from Mr. Rubin. But the
4 number of phones that Google itself has sold is small. So it
5 would affect it, yes.

6 **THE COURT:** Well, at least -- all right. Do you
7 agree with that, Mr. Jacobs? Or is it Mr. Norton?

8 Mr. Norton, you are the one who is working on this
9 part.

10 **MR. NORTON:** Mr. Purcell's counterpart, yes.

11 I don't think we agree with that. Professor Cockburn
12 has done all the steps such that if our damages were limited to
13 only the accused phones, then there is a number.

14 But Android itself infringes. And in a reasonable
15 royalty analysis, Sun would have expected to have been paid for
16 Google's right to use Android in that infringing manner.

17 And so the number of phones, we don't think, is --
18 the amount of indirect infringement, we don't think, is
19 necessary to establish our damages.

20 **THE COURT:** All right. So that's enough for right
21 now, on that point.

22 The jury is ready. The witness is here. I thought I
23 saw him. Please come back to the stand.

24 Counsel, you may set up. Let's bring in the jury.

25 (Jury enters at 7:53 a.m.)

1 **THE COURT:** Welcome, again. Please be seated.

2 Professor Mitchell, welcome back. Please make
3 yourself comfortable again, and speak into the microphone.

4 **THE WITNESS:** All right.

5 **JOHN MITCHELL,**
6 called as a witness for the Plaintiff herein, having been
7 previously duly sworn, was examined and testified as follows:

8 **THE COURT:** Everyone in the jury box ready?
9 (Jurors respond affirmatively.)

10 **THE COURT:** You may remember, we spent quite a lot of
11 time with Professor Mitchell yesterday. And by my notes, he
12 was on the stand not quite two hours. Maybe a little less.

13 Counsel tells me he has about 20 more minutes on
14 direct examination. And then we will go to the
15 cross-examination of Professor Mitchell.

16 Are you ready to go, Mr. Jacobs?

17 **MR. JACOBS:** Yes, Your Honor.

18 **THE COURT:** All right.

19 **DIRECT EXAMINATION RESUMED**

20 **BY MR. JACOBS:**

21 **Q.** Good morning, Professor Mitchell.

22 **A.** Good morning.

23 **Q.** You reported yesterday you did some testing on some
24 phones, to analyze whether you had additional evidence that
25 phones themselves contained the infringing components. I would

1 like to focus, first, on the testing you did on the '104
2 Patent. Can you describe the steps you took.

3 **A.** Yes. I downloaded and installed the Software Development
4 Kit and all of its features onto a laptop computer. And that
5 gave me the software and setup in order to connect the laptop
6 to each of a number of physical phones and examine the code on
7 them.

8 I also was able to rebuild the software system. I
9 had the Android source code, so I could change lines of source
10 code and rebuild the system and rerun it.

11 The way that I reran it was using the emulator, which
12 is a software portion of the SDK that runs like a physical
13 phone, so you can try the software on the laptop and see how it
14 works on the phone platform.

15 One experiment that I did was add print statements,
16 in effect, to parts of the Android source code so I could see
17 when that part of the source code was being executed.

18 So I inserted some statements that would print out or
19 display the progress of the emulator in the portions of the
20 code that carried out the steps of the '104 Patent invention.

21 So one thing I did was run the emulator using the
22 Software Development Kit, and see that all of those functions
23 were called.

24 The functions that I used there were a set of resolve
25 functions. We talked yesterday about resolving a field or

1 resolving a class or resolving a method.

2 So I had three or four of those functions in the
3 Resolve.c, and a similar number, maybe a little bit more, five
4 or six, in the dexopt portion of the code that I instrumented
5 and saw were called when the emulator runs.

6 **Q.** What did that lead you to conclude?

7 **A.** That that software is in the system and running on the
8 phone as it executes.

9 **Q.** And so what does that mean for whether those phones
10 contained the portions of the code that you identified as
11 infringing the '104 Patent?

12 **A.** Well, there are two steps here. One is to make sure that
13 the portions of the Android software that implement the '104
14 invention operate as you operate the software.

15 The second comparison is taking software off the
16 phone onto the laptop, and looking for those function names in
17 the actual executable that comes off the phone.

18 And so there I took four phones. I think there are
19 two Nexus phones, Nexus S and Nexus One.
20 And a Samsung Galaxy.

21 **MR. VAN NEST:** Objection, Your Honor.

22 **BY MR. JACOBS:**

23 **Q.** Was it --

24 **MR. VAN NEST:** Excuse me.

25 **THE COURT:** What's the objection?

1 **MR. VAN NEST:** Outside the report, I believe, as to
2 the HTC phone.

3 **THE COURT:** Is that outside the report?

4 **MR. JACOBS:** No, Your Honor. It's in Appendix A.

5 **MR. VAN NEST:** It was stricken, Your Honor.

6 **THE COURT:** I'm sorry?

7 **MR. VAN NEST:** It was stricken by an order.

8 **THE COURT:** I did that?

9 **MR. VAN NEST:** Yes.

10 **THE COURT:** Is that true?

11 **MR. JACOBS:** I think that one is still in, Your
12 Honor. That's the information I have. I'll double-check.

13 **THE COURT:** Is there a written order on this, or is
14 it verbalized?

15 **MR. JACOBS:** It's a written order, Your Honor.

16 **MR. KAMBER:** Written order, Your Honor.

17 **THE COURT:** Show me the written order. Let's just
18 pause here. While you're looking for that, here's what is
19 going on.

20 The rules -- here's the rule book. It's not my
21 rules. These are the national rules. The national rules have
22 a rule that experts such as Professor Mitchell have to put in a
23 report. Well, okay. See these big reports? And that's so
24 that both sides will know what the other side is going to say.
25 And then they do an opposition report and so forth.

1 And the rules say that if it's not in the report,
2 then they can't testify to it on direct examination. So I
3 cannot, frankly, remember this order that they're talking
4 about. If I struck something out of the report, then it's like
5 it wasn't there.

6 **MR. JACOBS:** Your Honor, I think I can answer this --

7 **THE COURT:** Okay.

8 **MR. JACOBS:** -- dispositively. The question was
9 whether it was in our local rules disclosure, you may recall.

10 **THE COURT:** All right. The local rules disclosure,
11 okay.

12 **MR. JACOBS:** And that was the triggering event for
13 the motion they are referring to. And I can point you to this
14 phone in our local rules disclosure.

15 **THE COURT:** I think I'm remembering it now, yes.

16 Mr. Van Nest, what do you say to that?

17 **MR. JACOBS:** Line 16.

18 **THE COURT:** These lawyers are just trying to follow
19 the rules. So don't hold it against anybody, okay. 16.

20 **MR. VAN NEST:** I have the order, Your Honor.

21 **THE COURT:** I don't see any 16.

22 **MR. JACOBS:** Line 16, Your Honor.

23 **THE COURT:** Okay.

24 **MR. JACOBS:** Refers to the HTC Droid Incredible.

25 **THE COURT:** What am I looking at here?

1 **MR. JACOBS:** A local rules disclosure of specific
2 phones.

3 **THE COURT:** It does say HTC's Droid Incredible. Is
4 that the one you're referring to?

5 **MR. JACOBS:** Yes.

6 **THE COURT:** All right. So this was in the --

7 **MR. JACOBS:** Now, I can --

8 **THE COURT:** It looks like it's in Volume 2 of his
9 report.

10 **MR. JACOBS:** Yes. He attached it to his report.

11 **MR. VAN NEST:** Your Honor, I have your order of
12 September 16, 2011. And it indicates that Oracle's -- because
13 the LG Optimus, the HTC Incredible 2, and Motorola ATRIX were
14 not among the products listed, Oracle may not now accuse them
15 of infringement.

16 **MR. JACOBS:** This is the Incredible, Your Honor?

17 **MR. VAN NEST:** September 26, 2011.

18 **THE COURT:** This is the Incredible, not the
19 Incredible 2. Is that -- I don't even know what an Incredible
20 is.

21 (Laughter)

22 **MR. VAN NEST:** It's incredible, that's for sure.

23 **THE COURT:** That's true.

24 All right. Is there an original and then a 2?

25 **MR. JACOBS:** Yes, Your Honor, there are subsequent

1 models.

2 **THE COURT:** All right. So I'm going to overrule the
3 objection.

4 **MR. JACOBS:** I would like to correct one thing that
5 Dr. Mitchell did say.

6 **THE COURT:** All right. Please do.

7 **BY MR. JACOBS:**

8 **Q.** You referred to a Samsung, Dr. Mitchell. Did you mean the
9 Samsung Captivate?

10 **A.** Yes, I think the name is Samsung Captivate Galaxy, maybe.

11 **Q.** Let's remind everybody where we were. The result of that
12 analysis was what?

13 **A.** Uhm, that these functions, the ones that I put in the
14 trace and saw execute, are also present in the code that's
15 actually on these phones.

16 **Q.** Now, what about the '520, how did you analyze whether the
17 '520 is infringed out in the field?

18 **A.** The '520, if you remember, is -- involved some steps that
19 are carried out by the dx tool. So that's on the developer
20 platform. So we won't see the steps that carry out the '520 on
21 the phone. This is in the developer's environment. The
22 developer who writes the software before they ship it to the
23 phone. But what we can see is the affect of that in the code
24 that's actually on the phone.

25 So I took an example. Gmail is the e-mail

1 application produced by Google. And so I looked for the -- the
2 array fill data command that we talked about yesterday, that
3 fills in data into a statically initialized array on the phone.

4 And then I looked for occurrences in the source code
5 for Gmail for static array initialization. That's the input to
6 the dx tool.

7 So if you remember, the dx tool takes the bytecode
8 that the compiler produces from static array initialization,
9 and converts it to these fill array data commands.

10 So I looked on the source code to see the static
11 array initialization, and I looked on the phone and saw
12 commands that are consistent with the output of dx tool.

13 So that shows that the input to the '520 steps that
14 are in dx tool are there in the source code, and the output,
15 the result of running those steps, is sitting on the phone.

16 **MR. VAN NEST:** Your Honor, excuse me.

17 I think I need to move to strike testimony about the
18 HTC Incredible. Although Your Honor's order allowed them to
19 proceed on it, the Appendix A that Dr. Mitchell referred to
20 doesn't analyze the Incredible. It analyzed the Incredible 2.

21 So to the extent -- and I'm not sure he gave any
22 testimony. It wasn't clear to me whether he was talking about
23 the Samsung Galaxy or the HTC Incredible, but to the extent he
24 was discussing the HTC Incredible I just want to note for the
25 record we're moving to strike any testimony about that as

1 outside his report.

2 **THE COURT:** Well, I'll do this. Is the testimony
3 already in, or is there more to come?

4 **MR. JACOBS:** It's done, Your Honor.

5 **THE COURT:** We will argue this out of the presence of
6 the jury. And if it's proper to strike it, then we will do it
7 and tell the jury later to disregard it. But let's not take
8 the jury's time up with this now.

9 **MR. JACOBS:** Thank you, Your Honor.

10 **BY MR. JACOBS:**

11 **Q.** Now, there are a couple of other phones in the case that
12 you didn't analyze directly, the HTC Evo 4G and the HTC G2, and
13 the Motorola Droid.

14 Taking all the evidence that you have available to
15 you about the code, the performance and the studies you did of
16 specific phones, what is your opinion whether those phones
17 likely infringed the '104 Patent?

18 **A.** First of all, as I already described, there's really no
19 reason for anyone to take this useful functionality that's in
20 the Android and take it out.

21 Second, I did analyze phones by the same
22 manufacturers in those cases. And so I also see that in the --
23 in phones produced by the same manufacturer, these -- the
24 functionality associated with the '104 and '520 patent is
25 demonstrated.

1 And so I think it's reasonable to conclude on that
2 basis that these additional phones have the same functionality
3 software and take advantage of the '520 Patent in the developer
4 environment in the same way.

5 **Q.** Now, you referred earlier to the Android SDK.

6 **A.** Yes.

7 **Q.** And can you just pause a minute and explain to us what the
8 SDK is and how it relates to your infringement analysis.

9 **A.** Okay. The SDK is the software development kit. So if you
10 wanted to write a game or another application for Android
11 phones, you would go on the web and download this all off the
12 website, put it on your own computer. And that would be the
13 environment, the programming environment that you would use to
14 develop your Android game or other application, and also the
15 environment you can use to test it.

16 So it's a full environment for writing software and
17 compiling it and running it on what -- a fully functional
18 emulator that operates just as if the software was on a
19 physical phone, but replicated on a laptop or a desktop
20 computer.

21 **Q.** And does it include an Android system image?

22 **A.** Yes. I think initially this comes with a built image.
23 And then with the source code, if you want to recompile or
24 rebuild another image, you can do that with the source code.

25 **Q.** And does the system image contain the code that you've

1 identified as infringing the '104 Patent?

2 **A.** Yes, I believe it does. This is just the same software
3 that you would find on the phone. At least that's the purpose
4 of it, is to be able to build applications for the phone and
5 test them in the same environment that they would operate on
6 the phone. It wouldn't be useful to test something in a way
7 that didn't match the phone execution environment.

8 **Q.** And does the system image relate to the '520 infringement
9 analysis you conducted?

10 **A.** Well, the '520, the dx tool is part of this development
11 environment. The development environment involves downloading
12 the JDK, the Java Development Kit, from the Oracle website and
13 then combining it with the additional Android functionality,
14 including the dx tool.

15 **Q.** I'd like to conclude by showing you a couple of the slides
16 that were used in Google's opening statement in the patent
17 phase, and ask you for your opinion on their accuracy.

18 So let's start with this slide, which Google used in
19 its opening patent statement. And this relates to the '104
20 Patent; correct, Dr. Mitchell?

21 (Document displayed.)

22 **A.** Yes, it does.

23 **Q.** And it says at the heading, "Dalvik Instructions Do Not
24 Contain Symbolic References."

25 What is your opinion of the correctness of this

1 slide?

2 **A.** I think if you take out "do not," that's correct. In
3 other words, I don't think this shows that Dalvik instructions
4 do not contain symbolic references.

5 It's basically showing the way in which they do
6 contain symbolic references.

7 **Q.** And why is that?

8 **A.** The instruction here has two fields. The instruction as
9 illustrated, anyway.

10 Remember from Andy McFadden's description, these are
11 fixed-width instructions, so that all the instructions have a
12 certain size.

13 The second part of the instruction that's illustrated
14 is a symbolic reference. It's a name that is used to reach the
15 symbols f-u-n that are used to find data in the field of an
16 object when the running program needs that data.

17 **Q.** Is f-u-n the data itself?

18 **A.** No. F-u-n is a name that a programmer gave to a field of
19 an object that's used to refer to the field.

20 The computer and the virtual machine have to find the
21 data associated with that name, and have to resolve this
22 reference in order to find the actual location.

23 **Q.** And that step would take place, figuratively, off to the
24 right of what's shown on this slide, correct?

25 **A.** Well, the actual data, such as the value in a field, is in

1 a completely different place in the computer. This is really a
2 representation of the code. The runtime data, values that you
3 have in fields, exist in a completely different part of the
4 memory.

5 Q. And then let's look at one of the slides that Google used
6 for the '520 Patent. And could you give us your assessment of
7 this slide?

8 (Document displayed.)

9 A. Yeah. I don't really see the dichotomy here. That is,
10 the '520 Patent talks about simulation. Simulation can --
11 involves things such as parsing, that we talked about.

12 Parsing instructions involves understanding the
13 pattern of each instruction and the repeated sequence of
14 things.

15 So I really don't see that something like processing
16 the symbols involved in the instructions and in the code means
17 that you are not doing simulation.

18 Actually, the code does simulate, as I described
19 yesterday. And there are some portions of the simulation that
20 involve parsing and looking at the syntactic structure of the
21 instructions.

22 Q. So how would you correct the heading on this slide?

23 A. Well, one is just to -- let's see. There's really one way
24 to get there by simulation. And the separation of that from
25 pattern matching, it just seems irrelevant, really, basically.

1 Q. Does simulated execution include pattern matching?

2 A. In the form that that's evident from the code, yes.

3 Q. So would that be an acceptable characterization, from your
4 standpoint?

5 A. Sure. I mean, you can call it a pattern or what you like.
6 There's, basically, the software steps through the -- the dx
7 tool steps through the instructions and parses them to see that
8 they are actually instructions initializing an array. And then
9 that simulation extracts the data.

10 MR. JACOBS: Thank you, Professor Mitchell.

11 THE COURT: All right. Cross-examination.

12 MR. VAN NEST: Thank you, Your Honor. Take me just a
13 moment to set up.

14 THE COURT: Sure.

15 MR. VAN NEST: Good morning, everyone.

16 CROSS EXAMINATION

17 BY MR. VAN NEST:

18 Q. Good morning, Dr. Mitchell. How are you?

19 A. Good morning. I'm fine.

20 Q. Good.

21 One of the key claim terms in the '104 Patent is the
22 term "symbolic reference," correct?

23 A. Yes.

24 Q. And you talked quite a bit about that yesterday?

25 A. Yes, I did.

1 Q. That's one of the terms that's relevant to determining
2 whether there's any infringement of any of the claims of the
3 '104 Patent, right?

4 A. Yes.

5 Q. And I think it would be good to start by framing up what's
6 in issue and what's not.

7 MR. VAN NEST: And I would ask our jurors to pull out
8 the '104 Patent Claim 11, the handout that Judge Alsup
9 provided.

10 Can we put that on the screen so Dr. Mitchell can see
11 it.

12 (Document displayed.)

13 BY MR. VAN NEST:

14 Q. You've looked over these handouts, Dr. Mitchell?

15 A. I've seen this, yes.

16 Q. You're familiar with it?

17 A. Yes.

18 Q. Now, it's clear, isn't it, that the portion that's not
19 underlined, that's not in dispute between the parties, right?

20 A. Yes.

21 Q. So, for example, on Claim 11 "a memory," there's no
22 dispute about there being a memory in the handsets or in the
23 software, right?

24 A. Correct.

25 Q. Every system like this has a memory, right?

1 A. Yes.

2 Q. Yeah. And then "intermediate form object code," that's
3 the bytecode we've been talking about. That is something
4 that's used with every virtual machine?

5 A. Yes.

6 Q. So that's not a dispute. Virtually every system that has
7 a virtual machine would have that in it, right?

8 A. Yes, in some form.

9 Q. Okay. And then "constituted by a set of instructions,"
10 every program has a set of instructions, too, right?

11 A. Yes.

12 Q. So no one is disputing that?

13 A. Correct.

14 Q. And then in the second limitation, "a processor
15 configured," obviously, every computer has a processor of some
16 kind, right?

17 A. Yes.

18 Q. Those aren't -- certainly not in dispute?

19 A. No.

20 Q. What's in dispute is the phrase "certain of said
21 instructions containing one or more symbolic references."
22 Right?

23 A. Yes.

24 Q. And it's clear from Claim 11 that the symbolic reference
25 has to be contained in the instructions, right?

1 A. Yes.

2 Q. And so that's one of the issues that is in dispute, is
3 whether or not the Android system, the dex files, for example,
4 use symbolic references in the instructions, correct?

5 A. Yes.

6 Q. Because every claim that you've analyzed requires that the
7 symbolic reference be in the instructions, right?

8 A. The wording varies across the claims.

9 Q. But, essentially, either contained in or in each one of
10 the limitations requires that there be a symbolic reference in
11 the instructions themselves, right?

12 A. Yes.

13 Q. Yes?

14 A. Yes.

15 Q. Yes. Okay. Let's just look at them so our jurors get a
16 sense.

17 Claim 39 -- I'll do these in the order you did them.

18 Claim 39. You see what's highlighted there in the
19 second or third limitation, "said instructions containing one
20 or more symbolic references." Correct?

21 A. I don't -- there --

22 Q. Actually, we had the one wrong one up. So in the second
23 underlining there's reference to "when the instruction contains
24 a symbolic field reference," correct?

25 A. Yes.

1 Q. So that's a requirement of Claim 39.

2 And Claim 40, same language in Claim 40, "when the
3 instruction contains a symbolic field reference," right?

4 A. Yes.

5 Q. And Claim 41, same language down near the bottom, "when
6 the instruction contains a symbolic field reference." It's a
7 requirement of Claim 41, as well, right?

8 A. Yes.

9 Q. And then Claim 27 -- everyone has handouts on these -- at
10 the very end of that underlined section, "any symbolic data
11 references in the set of original instructions."

12 A. Correct.

13 Q. So it's required there, as well?

14 A. Correct.

15 Q. And Claim 29, again near the bottom, "any symbolic data
16 references in the set of original instructions."

17 It's a requirement of Claim 29, as well, right,
18 Dr. Mitchell?

19 A. Could you just repeat what you mean by "it."

20 Q. Ah. It's required that there be a symbolic data reference
21 in the instructions?

22 A. Yes. In the set of instructions, yes.

23 Q. So we're in agreement that, with respect to the '104
24 Patent, one of the key issues is whether or not the dex files,
25 and in particular the instructions themselves, use or contain

1 symbolic data references?

2 A. Yes.

3 Q. Now, symbolic references aren't new to the '104 Patent,
4 right?

5 A. Right.

6 Q. They've been around for a long time?

7 A. Yes.

8 Q. Computers have been using symbolic references for many
9 years, right?

10 A. Yes.

11 Q. And you have described the use of symbolic references as
12 using symbolic names in source code, which allow programmers to
13 choose names that are meaningful or easy to remember. Right?

14 A. Yes.

15 Q. And the only example that you give in your report of a
16 symbolic reference is the name "current time," to refer to the
17 variable for keeping track of time. Is that right?

18 A. I don't recall other parts of the report in that detail.

19 Q. Do you recall using the example "current time" as a
20 symbolic reference?

21 A. Yes.

22 Q. And you don't recall using any others, right?

23 A. Not right now.

24 Q. Okay. And your point was that when we're talking about
25 symbolic references, we're typically talking about names that

1 programmers can use because they are easy to remember and they
2 sort of relate to what you're trying to do, right?

3 A. Yes.

4 Q. And, actually, your report distinguishes between
5 programmers using names and the computer itself using numbers
6 to represent memory locations, right?

7 A. Yes.

8 Q. You said that?

9 A. Yeah.

10 Q. Yeah?

11 A. Okay.

12 Q. And, as a matter of fact, that's what the Court's claim
13 construction does, it distinguishes between using names to
14 represent data and using numeric memory locations, right?

15 A. Yes. That -- that distinction, yes.

16 Q. And that's a distinction that's required by the way in
17 which Judge Alsup has construed the meaning of the phrase
18 "symbolic reference," right?

19 A. Yes.

20 Q. And that's the meaning that you applied in forming your
21 opinions in this case --

22 A. Yes.

23 Q. -- right?

24 MR. VAN NEST: Could we have revised slide 17 up on
25 the screen, please.

1 (Document displayed.)

2 **BY MR. VAN NEST:**

3 **Q.** Dr. Mitchell, is this the definition of symbolic reference
4 that you have used?

5 **A.** Yes.

6 **Q.** This is the Court's claim construction, right?

7 **A.** Yes.

8 **Q.** And it says a symbolic reference is "a reference that
9 identifies data by a name other than the numeric memory
10 location of the data." Correct?

11 **A.** Yes.

12 **Q.** And there's a second requirement, also, and that is that
13 the resolution occurred dynamically rather than statically,
14 right?

15 **A.** Yes.

16 **Q.** That's a second requirement of the resolution in the '104
17 Patent?

18 **A.** Okay.

19 **Q.** Okay. So let's focus on the first one. The.

20 First requirement relates here to symbolic reference,
21 which -- which, as we've established, must be found in the
22 instructions.

23 Now, numeric references, references that refer to a
24 memory location, they are also not new, right?

25 **A.** Right.

1 Q. They've been around for a long time?

2 A. Correct.

3 Q. Numeric references have been used for years?

4 A. Yes.

5 Q. And just like symbolic references, numeric references,
6 they've been around and used in computers for a long time?

7 A. Yes.

8 Q. And you actually describe numeric references in your
9 report as memory locations, right?

10 A. Okay.

11 Q. Yes?

12 A. Yes.

13 Q. Yes. And the patent itself gives an example of a numeric
14 reference as a specific location in memory. Right?

15 A. Yes.

16 MR. VAN NEST: Could we have the patent that's
17 TX 4015. Could we have Fig. 1A. And I'll show it on the
18 screen, but our jurors also have it.

19 (Document displayed.)

20 BY MR. VAN NEST:

21 Q. This is a figure from the patent that we're showing.

22 A. Yes.

23 Q. Dr. Mitchell, you're familiar with the patent by now, I'm
24 sure?

25 A. Yes.

1 Q. This is an example that the patent gives of a numeric
2 reference, correct?

3 A. Yes.

4 Q. And the numeric reference in this example is the 2 in the
5 instruction sequence on the left, correct?

6 A. Yes.

7 Q. That 2 is a numeric reference because it refers to a
8 location in the memory on the right?

9 A. Yes.

10 MR. VAN NEST: So just highlight slot 2. Don't
11 highlight "17."

12 BY MR. VAN NEST:

13 Q. So, again, the numeric reference is 2, and it's referring
14 to a location in memory, namely slot 2, correct?

15 A. Yes.

16 Q. It doesn't really care what data is there. It's just
17 sending you to slot 2 in the data memory on the right?

18 A. Yes.

19 Q. And, obviously, as we've established, if the instructions
20 only use numeric references, that doesn't infringe the '104
21 Patent, right?

22 A. Correct.

23 Q. Because you have to have symbolic references in the
24 instruction, in order to infringe?

25 A. Yes.

1 Q. Now, in this particular example -- by the way, the bottom
2 of Fig. 1A says "Prior Art." What does that mean?

3 A. That means that this was known prior to the patent
4 application.

5 Q. So numeric references were known prior to the application?

6 A. Yes.

7 Q. As we've established that's not something new.

8 A. Yes.

9 Q. Now, the patent talks about, and you talked about -- I'll
10 withdraw that.

11 You said it yesterday, the sort of new thing about
12 the '104 is that it converts a symbolic name to a numeric
13 reference, and then it stores that in an instruction for later
14 use. Correct?

15 A. Uhm, yes, that's one -- one aspect of the --

16 Q. One aspect. But, actually, resolving symbolic references
17 and turning them into numeric references, that part, that's not
18 new, that's been around a long time, too?

19 A. In some ways.

20 Q. In other words, the patent itself describes the fact that
21 the prior art contains examples of symbolic references being
22 resolved into numeric references; doesn't it?

23 A. In some ways. I don't recall exactly what you're
24 referring to.

25 Q. Well, let's take a look.

1 **MR. VAN NEST:** Could we put up TX 4015. That's the
2 patent. Could we go to Column 1, lines 26 through 32.

3 (Document displayed.)

4 **BY MR. VAN NEST:**

5 **Q.** And do you have a copy of the patent up there before you,
6 Dr. Mitchell?

7 **A.** There's a lot of paper here. This looks like a report, so
8 maybe not.

9 **Q.** Well, we'll get it up here on the screen in a minute.

10 **MR. VAN NEST:** Okay. Could we highlight Column 1,
11 lines 26 to 32, right here in the middle of the page. There we
12 go. Okay.

13 Actually, so our jurors follow along, on the right
14 side, those little numbers on the right, those are the line
15 numbers in the column.

16 **BY MR. VAN NEST:**

17 **Q.** Right, Dr. Mitchell?

18 **A.** Yes.

19 **Q.** And the columns are numbered at the top. So if you say
20 Column 1, lines 26, you're talking about the first column, and
21 the lines are numbered. And then says:

22 "In a compiled programming language, a
23 computer program compiles the source program
24 and generates executable code for a specific
25 computer architecture.

1 "References to data in the generated code are
2 resolved prior to execution based on the
3 layout of the data objects that the program
4 deals with, thereby, allowing the executable
5 code to reference data by their locations."

6 Do you see that language?

7 **A.** Yes, I do.

8 **Q.** That's what I was referring to.

9 That's a discussion that in the prior art, resolving
10 symbolic references to numeric references, that was known?

11 **A.** Yes. This refers to the C or C++ compiler.

12 **Q.** Okay. So I guess what's new is storing that information
13 in a -- one of the things that's new is storing that
14 information in a -- in an instruction somewhere, right?

15 **A.** Yes.

16 **Q.** Now, yesterday you accused two separate features in
17 Android of infringing the '104. Did I get that right?

18 **A.** Yes.

19 **Q.** One was this function called Resolve.c, that resolves
20 references, symbolic references to numeric references, as you
21 testified yesterday?

22 **A.** Yes. Resolve.c and the associated source code that it
23 also calls.

24 **Q.** And then the second thing that was separate, that you said
25 also infringes, that's called "dexopt," right?

1 A. Yes, that's the way I identified it.

2 Q. And you described dexopt -- I think you said that
3 infringes Claims 27 and 29. Or is it -- are you --

4 A. Yes.

5 Q. Those two. And then does Resolve.c -- in your opinion,
6 that infringes all the claims?

7 A. I think it's 11 and 39 through 41.

8 Q. Okay. So Resolve.c, that's 11, 39, 40, and 41, correct,
9 your opinion?

10 A. Yes.

11 Q. And dexopt, that's 27 and 29, right?

12 A. Yes, I believe so.

13 Q. But you would agree with me that whether you're talking
14 about Resolve.c or dexopt, you've got to find a symbolic
15 reference in the instructions?

16 A. Yes.

17 Q. Now, yesterday you showed us a series of slides that
18 illustrate your opinion on the Resolve.c function in Android,
19 correct?

20 A. Yes.

21 MR. VAN NEST: Could I have slide -- revised slide
22 25, please.

23 (Document displayed.)

24 BY MR. VAN NEST:

25 Q. Was this one of the slides that you showed us yesterday in

1 connection with your opinions on Resolve.c?

2 A. Yes.

3 Q. And it says at the bottom, "Resolve.c finds class name
4 using classIdx from dex instruction," right?

5 A. Yes.

6 Q. So "classIdx" on line 63 of this Resolve.c file, that's in
7 the dex instructions themselves?

8 A. Yes.

9 Q. And the item that you have identified, at least identified
10 yesterday as the symbolic reference, that is "classIdx" there
11 on the right?

12 A. Yes.

13 MR. VAN NEST: So let's just highlight -- can we just
14 highlight classIdx, Ben. We underlined it.

15 BY MR. VAN NEST:

16 Q. So with respect to at least this function, Resolve.c,
17 you've identified classIdx as the symbolic reference, right?

18 A. Yes.

19 Q. And classIdx, that's an index; isn't it?

20 A. That's another way of reading it, yes. "Idx" is an
21 abbreviation for index.

22 Q. So classIdx, that is an index, right?

23 A. Yes.

24 Q. And when you use "Idx," that stands for index?

25 A. Yes.

1 Q. So classIdx is an index?

2 A. I think that was Andy McFadden's explanation, also.

3 Q. All right. And the index classIdx tells the program to go
4 to a particular entry in a table, right?

5 A. At some point, yes.

6 Q. As a matter of fact, the only information that classIdx
7 provides is to a particular location in a table, in this case
8 the string_ids table, right?

9 A. No.

10 Q. The information one would get from classIdx is to a
11 location in another table?

12 A. In a table, yes.

13 Q. In a table. Correct?

14 A. Yes.

15 Q. And that initial instruction doesn't care what's in the
16 table. It just references the location of the table, right?

17 A. No.

18 Q. Now, you are calling this index a symbolic reference for
19 purposes of your infringement analysis, correct?

20 A. Yes.

21 Q. But in your opening expert report that you prepared to
22 illustrate your opinions, you called classIdx a numeric
23 reference, right?

24 A. There is one paragraph in the report where there's an
25 error. I was asked about that in deposition, and I corrected

1 that.

2 Q. But in your opening report, in connection with your
3 opinion in this case, you called classIdx a numeric reference,
4 right?

5 A. If you're referring to paragraph 269, yes.

6 Q. That's exactly what I'm referring to.

7 And paragraph 269 in your opening report calls this
8 classIdx -- which you're now saying is a symbolic reference --
9 a numeric reference, right?

10 A. Yes. That's an error.

11 Q. And that's important because if classIdx is a numeric
12 reference, then this example doesn't infringe the '104 Patent,
13 right?

14 A. Yes.

15 Q. And if our jurors were to conclude that classIdx is a
16 numeric reference, they would have to conclude, based on your
17 analysis, that this function you've illustrated here does not
18 infringe the '104 Patent, right?

19 A. No.

20 Q. Now, when you were first asked about paragraph 269 in your
21 opening report, you stood by it as accurate, right?

22 A. I remember what I said was, I certainly intended to make
23 this accurate.

24 Q. In other words, you were confronted with precisely this
25 paragraph in your deposition, and you said, "It's accurate as

1 far as I know"?

2 **A.** At that time, that was correct.

3 **Q.** And you believed that calling classIdx a numeric reference
4 was correct based on your review of it in the deposition under
5 oath, right?

6 **A.** No.

7 **MR. JACOBS:** Your Honor, objection.

8 **THE COURT:** What's the objection?

9 **MR. JACOBS:** The objection is that Your Honor has
10 stated how depositions may be used to impeach, and this is not
11 how they may be impeached.

12 **THE COURT:** That's true. You need to read from the
13 actual deposition or show it on the screen.

14 **MR. VAN NEST:** That's a fair point, Your Honor. Can
15 I play it?

16 **THE COURT:** Go ahead, yes.

17 **MR. VAN NEST:** I'll play it at 305, lines 11 through
18 4.

19 (Video deposition clip played in open court; not
20 reported.)

21 **MR. JACOBS:** Your Honor, may I read from an
22 additional passage in the deposition?

23 **THE COURT:** Is it adjacent to?

24 **MR. JACOBS:** It is adjacent to.

25 **THE COURT:** You may read that.

1 **MR. JACOBS:** "Professor Mitchell, directing" --

2 **MR. VAN NEST:** Where is this, Counsel?

3 **MR. JACOBS:** I'm sorry. 307, lines 21 through --

4 **MR. VAN NEST:** This is two pages later, Your Honor.

5 **MR. JACOBS:** Two pages, Your Honor.

6 **MR. VAN NEST:** It's two pages later. It's not
7 adjacent.

8 **THE COURT:** Let me see what happened in between. Let
9 me see the deposition. What was the part that --

10 **MR. VAN NEST:** I played 305, lines 11 through 4. And
11 he wants to read from page 307, a couple of pages later.

12 **MR. JACOBS:** Actually, Your Honor, you can see in the
13 intervening text Professor Mitchell is realizing that there's
14 an error in his report, and then he crisply summarized two
15 pages later in the deposition what the error in his report was.

16 **THE COURT:** Do you have the tape -- can you play
17 lines 11, 305, all the way straight through to the end of the
18 part that Mr. Jacobs wants to play?

19 **MR. VAN NEST:** I think we have the tape. Do we have
20 the whole tape, Ben?

21 **UNIDENTIFIED SPEAKER:** It will be unedited.

22 **THE COURT:** That's okay. Play the raw objections and
23 everything. I think under the rule of completeness that's a
24 fair request.

25 **MR. KAMBER:** Excuse me, Your Honor. What was the

1 number?

2 **THE COURT:** Through '07, whatever the line was
3 that -- what was the ending line, Mr. Jacobs?

4 **MR. JACOBS:** I was going to read through 308/22.

5 **THE COURT:** All right. Through 308/22.

6 Now, just so I give the jury a heads up on what's
7 going on here, the witness in the deposition gave certain
8 testimony. Then it appears that as time goes on he adjusted
9 his testimony.

10 You -- it's up to you to decide how much weight to
11 give to the adjustment, how much weight to give to the original
12 testimony. But in order to let you have that opportunity,
13 we're going to play the entire segment. It's probably going to
14 take about three or four minutes.

15 All right. Please do that.

16 **MR. VAN NEST:** Is this coming out of my time, Your
17 Honor?

18 **THE COURT:** No. This part will come out of
19 Mr. Jacobs' time.

20 **MR. VAN NEST:** Thank you.

21 (Laughter)

22 **THE COURT:** All right. Let's do that.

23 (Video deposition clip played in open court; not
24 reported.)

25 **THE COURT:** All right. So please put that on a CD so

1 it will be part of the record. And I'm going to charge five
2 minutes to Mr. Jacobs, since that was all read at his request.

3 All right. Please, continue on.

4 **MR. VAN NEST:** Thank you, Your Honor.

5 **BY MR. VAN NEST:**

6 **Q.** Now, with respect to this function Resolve.c,
7 Dr. Mitchell, you gave us two examples yesterday. One was this
8 classIdx we talked about. And then you gave us another example
9 of something called a field Idx, right?

10 **A.** Yes.

11 **Q.** And those are the only two examples you gave us of
12 Resolve.c?

13 **A.** No.

14 **Q.** Well, let's take the second one. Slide 22 -- if we could
15 put that up -- that was another example that you gave us of
16 infringement in the dex, right?

17 (Document displayed.)

18 **A.** Yes.

19 **Q.** And this is another example from Resolve.c, just like the
20 one we just looked at, correct?

21 **A.** Yes.

22 **Q.** And the slide says, "ifieldIdx is instance field
23 reference," and then you have in parens "(symbolic data
24 reference) input to dvmResolveInstField," correct?

25 **A.** Yes.

1 Q. So the field Idx on line 398 of this Resolve.c file, that
2 is in the dex instructions, correct?

3 A. Yes, I believe so.

4 Q. And that "ifieldIdx," that's what you've identified as the
5 symbolic reference in this example --

6 A. Yes.

7 Q. -- right?

8 "IfieldIdx," that is the symbolic reference in the
9 example here on slide 22, correct?

10 A. Yes.

11 Q. And that's also an index, right?

12 A. Yes.

13 Q. And you actually prepared some slides that you didn't show
14 the jury yesterday, to illustrate how this field Idx worked;
15 didn't you?

16 A. Yes.

17 Q. Because a field index simply tells the program to go to a
18 particular entry in a table, right?

19 A. That's one way it can be used.

20 Q. Okay. In other words, one way in which a field index can
21 be used is to tell the program, "Go to this location in the
22 field table." Right?

23 A. Yes.

24 Q. And you illustrated that in some slides you prepared but
25 didn't show the jury yesterday, correct?

1 A. Yes.

2 MR. VAN NEST: Could we look at Mitchell original
3 slide 18, please.

4 (Document displayed.)

5 BY MR. VAN NEST:

6 Q. This is a slide that you prepared to illustrate your
7 opinions?

8 A. Yes, at some point.

9 Q. And this says, "Dex Bytecode Instructions Contain Symbolic
10 Reference," right?

11 A. Yes.

12 Q. And we're looking here at the field reference that you
13 talked about on slide 22, right?

14 A. It's an example, yes.

15 Q. It's an example of the field Idx that you showed us
16 yesterday, correct?

17 A. Yes.

18 Q. Now, that series of four zeroes on the right, that's in
19 the instructions, correct?

20 A. Yes. The actual instruction is on the left there, in
21 binary form.

22 Q. Okay. And those are represented on the right as
23 "field@0000," correct?

24 A. Yes.

25 Q. Field@0000.

1 Now, "0000," that's a location in the field table,
2 right?

3 A. Yes. It's an index into the field array.

4 Q. It's an index to a specific location in the field table,
5 Dr. Mitchell, right?

6 A. Yes.

7 Q. And you illustrate that in the next slide, which you also
8 didn't show yesterday. That's slide 19. Correct?

9 A. Yes. That shows a portion of that field Idx table.

10 Q. What you're showing here is the field Idx pointing to a
11 specific location called "0000" in the field table, correct?

12 A. Well, it's a position in the table, yes.

13 Q. Position 0, that's a position in a table, right?

14 A. Yes.

15 Q. It's a memory location in data? Excuse me.

16 A. No.

17 Q. It's a memory location?

18 A. No.

19 Q. "Field_ids" refers in the slide here to the field table,
20 correct?

21 A. Yes.

22 Q. And "0" is a position in the field table?

23 A. Yes.

24 Q. Now, you also described the field id as a numeric
25 reference in your opening report, right?

1 A. In the paragraph that we discussed that I corrected.

2 Q. Actually, it's in an entirely different paragraph than the
3 one we just discussed; isn't it?

4 A. Okay. I think there's some misinterpretation there, but
5 let's take a look.

6 Q. Well, let me get your testimony before we look at it.

7 You also described this reference, which you're now
8 calling a symbolic reference, as a numeric reference in your
9 opening report, right?

10 A. No, I don't believe so.

11 Q. Let's take a look at paragraph 284, and put that on the
12 screen. It's in your opening report, Dr. Mitchell, if you want
13 to reference it there.

14 (Document displayed.)

15 Q. Do you have it? I have it on the screen, as well. And
16 you say -- I'm sorry. Are you there?

17 A. Yeah. I got it.

18 Q. It's on the screen.

19 A. All right. Got it three times over here.

20 Q. Okay. And you say in the second sentence there:

21 "The function dexGetFieldId is defined in the
22 DexFile.h and serves to return the numerical
23 reference."

24 And following that you have, open paren, "field id
25 with specified index," correct?

1 A. Yes, that's what the sentence says.

2 Q. So what you're referring to as a numerical reference in
3 this sentence is the field Id with the specified index, right?

4 A. No, not as you say. It refers to the field Id.

5 Q. And the field Id is the field index?

6 A. No. This is -- fieldIdx is directly in the code that
7 follows this and it's a pointer.

8 Q. You have described the field Id here as a numeric
9 reference. Do you stand by this statement in your report at
10 Paragraph 284?

11 A. Yes, as properly interpreted.

12 Q. Now, again, if the jury were to interpret fieldIdx as a
13 numeric reference, then it would not constitute a symbolic
14 reference in the instruction; correct?

15 A. Correct. Field Id and fieldIdx are two different things.

16 Q. Now, you repeatedly referred to Idx's in your report as
17 indexes, correct?

18 A. Yes. Idx is an abbreviation for index.

19 Q. MethodIdx, that's a method index, correct?

20 A. Yes.

21 Q. StringIdx, that's a string index, correct?

22 A. Yes.

23 Q. And indexes like the fieldIdx, as we saw, they pointed to
24 specific locations in tables?

25 A. Yes, in certain examples.

1 Q. Now, I want to turn away from Resolve.c to dexopt. That
2 was the other feature of Android that you testified about
3 yesterday.

4 And according to what I understood your testimony
5 was, the dexopt resolve symbolic references to numeric
6 references, correct?

7 A. Yes.

8 MR. VAN NEST: And could we have revised slide 44,
9 please?

10 (Document displayed)

11 BY MR. VAN NEST:

12 Q. Was this one of the slides that you presented yesterday,
13 Dr. Mitchell?

14 A. I believe so, yes.

15 Q. Now, again, with dexopt the same requirement exists. You
16 have to have a symbolic reference in the instructions
17 themselves, correct?

18 A. Yes, they are the same instructions.

19 Q. And the instructions here that you're talking about are at
20 Line 621 and 622; right?

21 A. No.

22 Q. Well, let me ask it this way: Was the field reference
23 constant pool offset what you identified yesterday as a
24 symbolic reference?

25 A. Yes.

1 Q. Okay. So let's underline that.

2 The field reference constant pool offset, you say in
3 this example that's the symbolic reference, right?

4 A. Yes.

5 Q. Now, an offset -- strike that.

6 Is that represented here in Line 622 as field@CCCC?

7 A. Yes, it's described as that in the comment.

8 Q. So, field@CCCC.

9 Now, CCCC that's a representation that would usually
10 be numbers in the computer, right?

11 A. Yes. "C" is a -- acts as a decimal number.

12 Q. So this could be 0000, just like the example we looked at
13 a moment ago in Resolve.c, correct?

14 A. Yes.

15 Q. But whatever it is, this reference points to a location in
16 a table, right?

17 A. A position in a table, yes.

18 Q. Okay. And you've said in your report and in your
19 testimony that an offset is a numeric reference, correct?

20 A. Yes. A byte offset in a -- to an object that's data, yes.

21 Q. So an offset is a numeric reference, not a symbolic
22 reference; correct?

23 A. In this case where it's to data, yes.

24 Q. And this is an offset, the field reference constant pool
25 offset, right? That's an offset?

1 A. Yes, it's an offset in the code --

2 Q. And --

3 A. (Continuing) -- not an offset in data.

4 MR. JACOBS: Your Honor, Mr. Van Nest is over
5 speaking Dr. Mitchell's very short concise answers.

6 THE COURT: All right. Let's try to remember to let
7 the witness finish.

8 Please go ahead.

9 BY MR. VAN NEST:

10 Q. Just to be clear, though, Dr. Mitchell, the instruction
11 you are accusing as a symbolic reference in this dexopt example
12 is one in which there's a pointer to a -- is an index, an
13 offset, where there is a pointer to a specific location in
14 memory?

15 A. No.

16 Q. Now, there is a second requirement, and that is that the
17 resolution from a symbolic to a numeric reference be done
18 dynamically, correct?

19 A. Yes.

20 Q. And that's a requirement that comes from the Court's claim
21 construction of "symbolic reference," right?

22 A. Yes.

23 Q. That's an additional requirement to show infringement?

24 A. Yes.

25 Q. So the resolution from -- if there were a symbolic

1 reference that was resolved to a numeric reference, even if
2 that were so, you would also need to show that that was done
3 dynamically; correct?

4 **A.** Yes.

5 **Q.** And you said that that means done at runtime essentially,
6 right?

7 **A.** Yes, that's one way that it can be done dynamically.

8 **Q.** And you presented Slide 50 to the jury yesterday.

9 **MR. VAN NEST:** Can we have revised slide 50, please?

10 (Document displayed)

11 **BY MR. VAN NEST:**

12 **Q.** This is one of the slides that you presented on the
13 subject of dexopt, correct?

14 **A.** Yes.

15 **Q.** And the sentence that you highlighted says:

16 "Some of these" -- that means some of the
17 operations -- "require information only
18 available at runtime."

19 Correct?

20 **A.** Yes.

21 **Q.** But the sentence goes on to say:

22 "Others can be inferred statically when
23 certain assumptions are made."

24 Right?

25 **A.** Yes. That's what it says.

1 Q. And you understand based on Judge Alsup's claim
2 construction that if the resolution is done statically, not
3 dynamically, then there is no infringement, right?

4 A. Yes.

5 Q. Because the claim requires that the resolution be done
6 dynamically --

7 A. Yes.

8 Q. (Continuing) -- right?

9 Now, in general, the instructions -- we haven't heard
10 from Mr. Bornstein and we haven't heard fully yet from Mr.
11 McFadden, but the documentation you reviewed concerning dexopt
12 talks about performing this function statically, right?

13 A. There is a -- yes. There is a statement to that effect in
14 Dan Bornstein's overview.

15 Q. There are a number of statements to that effect in
16 Mr. Bornstein's overview and in his slides and in the
17 documentation concerning dexopt, right?

18 A. I don't know about the number. I'm familiar with one.

19 Q. Now, you put up Slide 18 yesterday.

20 MR. VAN NEST: Could we have revised Slide 18?

21 (Document Displayed)

22 BY MR. VAN NEST:

23 Q. This is the slide that you presented yesterday and I think
24 you described as heart of the heart of the matter.

25 A. Yes. This is a good summary.

1 Q. And you presented this slide as part of your analysis of
2 infringement for the jury, correct?

3 A. Yes.

4 Q. But this slide is incomplete, isn't it?

5 A. I'm not sure what you mean.

6 Q. This slide cuts off some of the most important language in
7 Mr. Bornstein's quotation, right?

8 A. I don't think so, but --

9 Q. Would someone reading this know that there were some words
10 that precede what you're showing the jury on the slide?

11 A. I think so.

12 Q. There isn't an ellipses. There isn't a dot, dot, dot.
13 There isn't a heads-up. It just starts:

14 "When a DEX file arrives on a device."

15 Right?

16 A. Yes.

17 Q. Now, you know that's not the entirety of Mr. Bornstein's
18 quite, don't you?

19 A. I think he speaks for an hour.

20 Q. You have got this quote and this language with the full
21 text in your report?

22 A. There is more text in my report, yes.

23 Q. He says -- he says that, "This function is performed
24 statically," right, in the very line before the line you chose
25 to show to the jury?

1 A. Yes.

2 Q. And you're okay with that?

3 A. I believe I have explained the way in which this is
4 dynamic.

5 MR. VAN NEST: Well, can we put up the whole thing?

6 (Document displayed)

7 BY MR. VAN NEST:

8 Q. I'm putting up Paragraph 96 from your report, and I've
9 highlighted what you showed the jury.

10 MR. VAN NEST: Can we highly the first part of the
11 sentence?

12 (Document highlighted)

13 BY MR. VAN NEST:

14 Q. That says:

15 "So, as an example of static linking before,
16 when..."

17 You chose to pull that out of what you showed the
18 jury as the heart of your analysis, right?

19 A. No.

20 Q. Well, who made that choice?

21 A. I'm disagreeing this is the heart of the analysis of
22 static versus dynamic. This isn't a point discussing whether
23 there's symbolic references in the code.

24 Q. In any event, Dr. Mitchell, you never showed this language
25 to the jury yesterday, did you?

1 A. No, I did not.

2 Q. And this -- you relied heavily on what Mr. Bornstein said.
3 Did I get that right?

4 A. No, not heavily.

5 Q. You talked about -- you showed his video, right?

6 A. I don't think I did.

7 Q. You showed his slides?

8 A. I have some information based on his tutorial, yes.

9 Q. But you never showed the jury this line that says, "As an
10 example of static linking..."

11 That's how he described dexopt, right, as a static
12 operation?

13 A. Yes, yes.

14 Q. And we have already established that if dexopt does
15 whatever it does statically, it doesn't infringe; right?

16 A. Okay.

17 Q. Isn't that right?

18 A. Yes.

19 Q. Now, it's also true that when Mr. Bornstein made these
20 comments, he was referring to a slide that he prepared to
21 illustrate this, right?

22 A. Yes.

23 Q. And that slide also showed that this function occurs
24 statically at install time, right?

25 A. It may. I don't recall the slide --

1 Q. You chose not to show that to the jury yesterday either,
2 right?

3 A. Yes.

4 MR. VAN NEST: Could we go to Mr. Bornstein's
5 presentation at TX 32, Slide 35?

6 (Document displayed)

7 BY MR. VAN NEST:

8 Q. Now, this actually is the slide that Mr. Bornstein was
9 talking about when he made the statement that you referenced in
10 your slide yesterday, correct?

11 MR. JACOBS: Your Honor, objection.

12 THE COURT: What's the objection?

13 MR. JACOBS: The previous question transparently
14 mischaracterized what happened yesterday. The slide in
15 question was shown to the jury yesterday.

16 THE COURT: The slide on the screen now?

17 MR. JACOBS: Yes. It was a side-by-side with this
18 slide and another slide.

19 MR. VAN NEST: I will withdraw that, your Honor.
20 There were so many slides yesterday.

21 THE COURT: Well, all right. The record is now
22 corrected on that, so. But continue on.

23 MR. VAN NEST: I'm actually not sure it's right, but
24 I'll check to make sure.

25

1 BY MR. VAN NEST:

2 Q. In any event, Dr. Mitchell, this is the slide that
3 Mr. Bornstein was discussing in that passage that you quoted
4 part of, right?

5 A. I don't recall exactly what slide he had up, but it's
6 possible.

7 Q. Okay. And this talks about "Install Time Work in Dexopt,"
8 right?

9 A. Yes, that's the title of the slide.

10 Q. And he's talking about optimization, right?

11 A. Yes.

12 Q. And he calls what dexopt does static linking there in the
13 second bullet, right?

14 A. As I read the slide, that's one of the -- one of the
15 optimizations.

16 Q. Okay. And if this function is performed statically as we
17 said, then dexopt doesn't infringe either, right?

18 A. Right.

19 Q. And that would be true for both of the claims that you're
20 accusing dexopt of infringing, 27 and 29, right?

21 A. Yes.

22 Q. Now, I take it you're not accusing the Java compiler of
23 infringing anything, are you?

24 A. No.

25 Q. No. Anybody can use a Java compiler, right?

1 A. Under certain terms, yes.

2 Q. And although you showed us a lot of pictures yesterday of
3 a Java compiler, that's not a feature in Android that you're
4 accusing of infringement, right?

5 A. It's not a Google product.

6 Q. Right. It's not a Google product. It's not an infringing
7 feature.

8 What you're accusing are dexopt and Resolve.c,
9 correct?

10 A. Yes.

11 Q. All right. Let's talk for just a minute about the '520
12 patent. Now, Claim 1, let's switch gears clear. Claim 1
13 requires simulating execution of the bytecodes of the class
14 initialization method against a memory, correct?

15 A. Yes.

16 Q. I will ask the jurors to pull out their handout.

17 You have it there on the screen. I believe that only
18 Claims 1 and 20 are in play. Is that right, Dr. Mitchell?

19 A. Yes, I believe so, too.

20 Q. Okay. So looking at Claim 1, again, there is a number of
21 limitations here that aren't underlined, so they are not an
22 issue, right?

23 A. Yes.

24 Q. And the one that's underlined is "simulating execution of
25 the bytecodes of the class initialization method against a

1 memory," right?

2 A. Yes, that's part of it.

3 Q. And that's the claim term in the '520 that's disputed
4 between the parties?

5 A. Yes.

6 Q. And you heard yesterday -- strike that.

7 You discussed yesterday that simulating execution is
8 required to practice the '520?

9 A. Yes.

10 Q. And if a system -- if code doesn't perform simulated
11 execution, then it's not infringing, right?

12 A. Yes, approximately.

13 Q. Now, the example of simulated execution given in the
14 patent actually requires that the code perform the operation
15 reflected by the bytecode, right?

16 A. No.

17 Q. Well, let's look at TX 4011, that's the '520 patent. The
18 jurors have this.

19 Q. Could we look at Fig. 3?

20 (Document displayed)

21 Q. Fig. 3 is a description of the steps performed by the
22 invention, Dr. Mitchell?

23 A. I'm not sure that's the correct way to characterize it.
24 It's a specification of a patent.

25 Q. It's in the specification. This is one example of how the

1 invention a practiced, right?

2 **A.** Yes, I believe it's one example.

3 **Q.** Okay. And in this example -- this is a method claim, so
4 we're not talking about a device. We're talking about a
5 method, how to do something; correct?

6 **A.** Yes.

7 **Q.** And this Fig. 3 illustrates the steps in a method, right?

8 **A.** Yes.

9 **Q.** And Step 310 -- if we can highlight that -- says:

10 "Perform operation reflected by bytecode."

11 Right?

12 **A.** Yes.

13 **Q.** And that's a description or a reference to this simulating
14 execution, right?

15 **MR. JACOBS:** Objection, your Honor.

16 **THE COURT:** What's the objection?

17 **MR. JACOBS:** The jury could be confused between the
18 difference between an illustrative embodiment in the patent and
19 the claim language itself.

20 The Court has made clear that it's the claim language
21 that controls.

22 **MR. VAN NEST:** Well, this is fair cross, your Honor.

23 **THE COURT:** Well, what counsel is true. The claim
24 language is what governs, but the drawings are relevant because
25 they are part of the explanation of either the prior art or how

1 the invention is supposed to work.

2 So it is proper cross-examination to get into it.

3 But counsel is correct, you might want to keep in mind what the
4 actual claim language is.

5 I think -- can we take a break at this point?

6 **MR. VAN NEST:** Sure, your Honor.

7 **THE COURT:** All right. We will take a 15-minute
8 break. Remember the admonition.

9 **THE CLERK:** All rise.

10 (Jury exits courtroom at 9:11 a.m.)

11 **THE COURT:** Please be seated.

12 Anything the lawyers need me for?

13 **MR. VAN NEST:** I don't believe so, your Honor.

14 **MR. JACOBS:** Your Honor, just a quick item. We
15 reviewed the transcript of Professor Mitchell's testimony
16 yesterday and there are a few places where the transcript says
17 that he said the phrase "instruction string" and what he
18 testified to was "instruction stream," and that could matter.

19 And so I wanted to place on the record that --

20 **MR. PETERS:** It was you.

21 (Laughter.)

22 **MR. JACOBS:** Oh, where I said. Excuse me, your
23 Honor.

24 Where I am quoted as saying "instruction string" and
25 what I said was "instruction stream." And it matters to

1 understand the colloquy.

2 **THE COURT:** I just can't take your word for it. If
3 you lawyers can't agree on it, then we have to have an
4 evidentiary hearing or do whatever. There are rules on this.

5 The spoken word in the first instance is the
6 providence of the court reporter. And so you two see if you
7 can agree on it. If you can't, then the court reporter will
8 take a look at it and see if she thinks she made a mistake, but
9 I can't just willy-nilly start correcting the transcript.

10 **MR. JACOBS:** Understood, your Honor.

11 **MR. VAN NEST:** We're fine, your Honor. We don't have
12 any issues for the Court.

13 **THE COURT:** All right. I need -- I wanted to take a
14 break because the marshal has come in and I need to speak with
15 him on something that has nothing to do with your case.

16 So, all right. We'll take our 15 minutes at this
17 time.

18 (Whereupon there was a recess in the proceedings
19 from 9:13 a.m. until 9:27 a.m.)

20 **THE COURT:** Please be seated. Let's bring in the
21 jury.

22 (Jury enters the courtroom at 9:28 a.m.)

23 **THE COURT:** Okay, please be seated.

24 Go ahead.

25 **MR. VAN NEST:** Thank you, your Honor.

1 BY MR. VAN NEST:

2 Q. We were talking about the '520 patent, Dr. Mitchell, when
3 we took our break, correct.

4 A. Yes.

5 Q. Now, the feature in Android that you accuse of
6 infringement, '520, that's the dx tool?

7 A. Yes.

8 Q. That's a tool that developers use to compile Java bytecode
9 into Dalvik bytecode?

10 A. Yes.

11 Q. That doesn't actually ever go on a handset. That's a tool
12 that the developers use when they are developing their code in
13 the first place?

14 A. Yes.

15 Q. And there's an example of the method of the '520 set forth
16 in the patent, correct?

17 A. Yes.

18 Q. We saw -- before the break we saw this Fig. 3, correct?

19 A. Yes.

20 Q. And Fig. 3 says:

21 "Perform operation reflected by bytecode."

22 Do you see that?

23 A. Yes.

24 Q. There's also an example -- I think you showed yesterday --
25 of code in the patent that explains how the invention works,

1 correct?

2 **A.** I believe there's an example of code. I don't believe I
3 showed it.

4 **Q.** Okay. Well, let's take a look at it. It's Code 5. It's
5 in Column 6.

6 **MR. VAN NEST:** Could we highlight?

7 (Document highlighted)

8 **BY MR. VAN NEST:**

9 **Q.** This is called Code Table 5. This is part of the patent,
10 right?

11 **A.** Yes, I believe this is in the patent specification.

12 **Q.** This is in the specification and this is one of the
13 examples of how the invention works, correct?

14 **A.** Yes, it's an example.

15 **Q.** And this is actually code that is illustrative of how
16 someone would perform this method, right?

17 **A.** Yes. I believe it's one example.

18 **Q.** And if you look at the right here, Line 40, it says:

19 "Get constant pool. Create stack for play
20 execution."

21 Do you see that?

22 **A.** Yes, I see that.

23 **Q.** And a "stack," the "stack" that's part of the memory?

24 **A.** Yes. That's the way the Java Virtual Machine works.

25 **Q.** And the memory is used in some fashion in this play

1 execution, at least according to the patent?

2 **A.** Yes. The stack is used.

3 **Q.** And you then -- just right below that, you "create local
4 variables for play execution," correct? That's part of the
5 play execution called for in Claim 1?

6 **A.** I'm not sure I understand. This is not called for in
7 Claim 1.

8 **Q.** Well, let's back up a minute. This is part of our example
9 of how you perform the method that the '520 is claiming, right?

10 **A.** Yes. That's a comment in this example code.

11 **Q.** Okay. And a little bit further down there is a reference
12 to --

13 **MR. VAN NEST:** A little bit further down Ben. You
14 have to open up a little bit more the page. All the way down
15 to the bottom of this.

16 (Document displayed)

17 **BY MR. VAN NEST:**

18 **Q.** You actually, right at Line 46, you start with an empty
19 stack, right? That's a reference to -- that's a reference to
20 the stack in the memory, correct?

21 **A.** I'm not sure what you mean by "stack in the memory," but
22 the comment says "start with an empty stack," yes.

23 **Q.** Well, the stack is part of the memory, right?

24 **A.** When a program that uses a stack executes, the stack is
25 stored in memory, yes.

1 Q. Okay. Fair enough.

2 And this example talks about using the stack as part
3 of the play execution performed, right?

4 A. Yes.

5 Q. You're actually pushing values onto the stack as you go
6 along and play execute the code?

7 A. Yes.

8 Q. Now, the dx tool uses pattern matching, right?

9 A. There is an element of that.

10 Q. Okay.

11 A. Yes.

12 Q. There is an element of the dx tool that uses pattern
13 matching?

14 A. Yes. I would say there is an element of the dx tool in
15 the -- an element of pattern matching in the code, the tool.

16 Q. And you studied the dx code, right?

17 A. Yes.

18 Q. You've read it?

19 A. Yes.

20 Q. And it talks about using pattern matching in connection
21 with initializing arrays, right?

22 A. I'm not sure about that. I know there is some weird
23 pattern, but I don't know about pattern matching in the code
24 actually.

25 Q. Well, it's pretty clear. It's pretty clear from what you

1 looked at that what is being discussed in the code, in the dx
2 tool, is pattern matching, right?

3 A. No, not really.

4 Q. Well, let's go to revised Slide 62.

5 (Document displayed)

6 Q. This is one of the slides you showed yesterday, correct?

7 A. Yes.

8 Q. And there's a -- there's a method there on Line 99 calls
9 parseInstruction, correct?

10 A. Yes.

11 Q. And that's part of how the dx tool initializes an array?
12 It uses that instruction?

13 A. No. I don't think that's a correct characterization.

14 Q. Well, it uses that method as one of the features in
15 connection with initializing arrays, right?

16 A. No.

17 Q. Well, let's go on to Slide 63.

18 (Document displayed)

19 Q. Slide 63 shows parseNewarray, correct?

20 A. Yes.

21 Q. And is that one of the methods that you accuse of
22 infringing the '520?

23 A. Yes. It's a portion of the code.

24 Q. Okay. And by the way, that -- that code is in a different
25 file from the simulator code you shows us yesterday, right?

1 A. Yes.

2 Q. It's in a completely different class, right?

3 A. Yes.

4 Q. And that code is called by other classes, other than the
5 simulator class, right?

6 A. Sure.

7 Q. It's used for a lot of things?

8 A. Yes.

9 Q. And it's described here in the code as "try to match the
10 array initialization idiom," correct?

11 A. Yes.

12 Q. And then it goes on to say:

13 "For example, if the subsequent code is
14 initializing an integer array, we are
15 expecting the following pattern repeatedly."
16 Correct?

17 A. Yes.

18 Q. That's at least consistent with performing pattern
19 matching, isn't it?

20 A. Yes, in some sense. Although there are other more
21 specific things associated with pattern matching that are not
22 here.

23 Q. And there's actually a pattern shown below, right: Dup,
24 push, push, and *astore?

25 A. Sure, yes.

1 Q. That's a pattern?

2 A. That's the way it's described here, yes.

3 Q. And that pattern does repeat in the Java bytecode,
4 correct?

5 A. Yes.

6 Q. That pattern appears and repeats in Java bytecode when an
7 array is being presented, right?

8 A. Yeah. In the static array, initialization that matters
9 here.

10 Q. And I take it the patent itself makes no mention of
11 pattern matching, right?

12 A. I don't recall one.

13 Q. And you don't recall -- there's certainly nothing about
14 pattern matching in either Claim 1 or Claim 20, correct?

15 A. No, it doesn't seem to address that one way or the other.

16 Q. And the word "pattern" and the words "pattern matching,"
17 they never appear anywhere in the patent, in the claims, in the
18 specification, in the title; nowhere, right?

19 A. I don't recall.

20 Q. Now, I take it the '520 patent is directed only to the
21 function of initializing arrays, correct? That's the only time
22 you would use it?

23 A. I'm confused about when you think the initialization
24 occurs, but it is relevant to array initialization.

25 Q. In other words, Dr. Mitchell, if a program didn't have any

1 arrays in it, the '520 wouldn't make any difference one way or
2 the other, right?

3 A. Yes, that's correct.

4 Q. Because it only comes into play if you have an array that
5 you need to initialize in the first place, right?

6 A. Yes, absolutely.

7 Q. And as of the time that you prepared your report, you
8 hadn't done any investigation to determine how often a real
9 Android application uses an array, right?

10 A. I don't recall the time frame in which I investigated
11 that.

12 Q. In other words, at the time of your deposition you told us
13 you hadn't done any investigation to determine how often an
14 Android app used static arrays, right?

15 A. I don't recall, but if that's what I said in my
16 deposition, then that's what I said.

17 MR. VAN NEST: Well, could we play Dr. Mitchell's
18 deposition, Page 96, Lines 20 through 23?

19 (Videotape played in open court;
20 not reported.)

21 BY MR. VAN NEST:

22 Q. And you told us that other than looking around a little
23 bit, you ran out of time on that particular issue, right?

24 A. I may have.

25 Q. Did you?

1 A. I don't recall saying that, but if it's in the transcript,
2 then I said it.

3 Q. Can we play his depo, Page 96, Line 24 through 97, Line 3.

4 (Videotape played in open court;
5 not reported.)

6 Q. Now, yesterday you told us that you relied on some
7 benchmark test that Dr. Poore did, right?

8 A. Yeah. I'm familiar with those.

9 Q. You read -- he did a report and you read the report?

10 A. Yes. And I worked with him further, prior to that.

11 Q. And you thought the findings of his benchmark testing were
12 important enough to talk to the jury about him yesterday,
13 right?

14 A. Yes. I was asked about that.

15 Q. Now, what he did was create a single program that says
16 "Hello World," right?

17 A. No. I think he created several programs.

18 Q. Well, the only program that he showed in his report was
19 one that reports "Hello World," right? That's what it does.

20 A. I believe -- yes, I believe it prints "Hello World," but
21 it also does something else.

22 Q. And I take it the program that he wrote, you couldn't play
23 a game using that code, right?

24 A. I don't think he wrote a game program.

25 Q. And you couldn't make a phone call?

1 A. No. I don't think that had anything to do with what he
2 was trying to figure out.

3 Q. And you couldn't edit a document?

4 A. No. There's no reason to expect him to do that either.

5 Q. Because the only thing that his program was capable of
6 doing was printing out "Hello World," right?

7 A. No.

8 Q. Was there something else?

9 A. Yes. It was meant to test array initialization, so I --

10 Q. So there is an array attached to the program, but the only
11 thing other than initializing the array that can be done is to
12 print the words "Hello World," right?

13 A. No. What do you mean "can be done"?

14 Q. Performed by the program.

15 A. Are you asking what the program he wrote does?

16 Q. Yes.

17 A. After it goes through dx tool and then somebody runs it?

18 Q. Yes, yes.

19 A. Much later when somebody runs it, it doesn't do -- the
20 observable output is it prints "Hello World."

21 Q. That's it?

22 A. Yes.

23 Q. It is not even an effort to simulate a real Android
24 application, correct?

25 A. No. It's not representative of applications, but it does

1 test the behavior of the dx tool on static array
2 initialization. That's what it was created for and that's what
3 it does.

4 Q. Okay. And it was never intended to test how a real
5 Android application might work in the real world with or
6 without arrays, correct?

7 A. I don't think that's really a fair characterization.

8 Q. Well, wouldn't we agree that nobody today would buy a
9 program or application for their phone if all they could do
10 with it is print out "Hello World"?

11 A. I agree that that's not a very exciting game or
12 application, but I don't think that's relevant to the issue
13 here.

14 Q. And what he did was he hung a series of increasingly large
15 arrays onto that program, right?

16 A. Yes. That was the purpose of the experiment.

17 Q. He started with an array of 10 and tested that, right?

18 A. Yes.

19 Q. And then he -- he put an array of 20 and tested that?

20 A. I don't recall the exact sequence, but he tested a number
21 of arrays of different sizes and of different types.

22 Q. And then on this program that does nothing other than
23 print out the words "Hello World," he tested an array of a
24 thousand variables, right? It covers three pages in his
25 report.

1 A. Yeah. He's trying to test arrays of different sizes to
2 see how effective the outcome is.

3 MR. VAN NEST: Could I have Exhibit 266 up, Page 43?
4 (Document displayed)

5 BY MR. VAN NEST:

6 Q. This is his report, Dr. Mitchell?

7 A. Yes.

8 MR. VAN NEST: Could we go to the third page,
9 Page 43? Next page.

10 (Document displayed)

11 BY MR. VAN NEST:

12 Q. This is Page 1 of the size of the array that he hung onto
13 a program that says "Hello World," right?

14 A. I believe so, yes.

15 Q. And here is a Page 2.

16 (Document displayed)

17 Q. And Page 3.

18 (Document displayed)

19 Q. There's a thousand different variables in this array,
20 correct?

21 A. No. It's not accurate to call those "variables."

22 Q. Well, what would we call them?

23 A. Values.

24 Q. Values?

25 A. Entries.

1 Q. There's a thousand different values in this array, right?

2 A. Yes.

3 Q. And wouldn't we agree that in the real world you would
4 never encounter a program with the an array of a thousand
5 values that only prints out the words "Hello World"?

6 A. I lost track of which is "yes" or "no," but that is not a
7 common form for an application; but it's a very good test
8 program.

9 Q. All right. Now, I want to go back for just a minute to
10 the mistake you made in your opening report calling classIdx in
11 the instructions a numeric reference.

12 Do you recall discussing that earlier this morning?

13 A. Yes, I do.

14 Q. Now, is that the only time in your report that you called
15 an index in the instructions a numeric reference?

16 A. I don't recall.

17 Q. Didn't you repeatedly refer to indexes in the instructions
18 as numeric references in your report?

19 A. I don't recall doing that.

20 MR. VAN NEST: Could we have Paragraph 272 up on the
21 screen, please.

22 (Document displayed)

23 BY MR. VAN NEST:

24 Q. Do you have your report there, Dr. Mitchell?

25 A. Yes, I do.

1 Q. Could you turn in it to Page 272? I'm referring to your
2 opening report.

3 This is also in the section "Discussing Your
4 Infringement Analysis," correct?

5 A. Yes, I believe so.

6 Q. And you are talking here about Resolve.c, right?

7 A. Yes.

8 Q. Right?

9 And Paragraph 272 says:

10 "The function 'dvmResolveMethod' determines
11 or resolves symbolic references (method
12 names) to numerical references ('methodRef'
13 or 'methodIdx').

14 Do you see that language?

15 A. Yes.

16 Q. So there you have called methodIdx in the instructions a
17 numerical reference, right?

18 A. I'm not sure that's the purpose of the sentence, but I can
19 see how you could read it that way.

20 Q. You can see how I could read it that you're calling
21 methodIdx, which is an index, a numerical reference, right?

22 A. Apparently.

23 Q. Is that the same mistake you made with classIdx, Dr.
24 Mitchell?

25 A. I don't know without looking at the code.

1 Q. Now, you also did it with respect to stringIdx, didn't
2 you?

3 A. I don't recall that.

4 Q. Well, let's take a look at Paragraph 293 in your report.
5 Again, this is in your opening report, your infringement
6 analysis.

7 Now, just to make sure I understand, you're now
8 calling classIdx a symbolic reference, right?

9 A. Yes. It could be the same sentence as repeated, cut and
10 paste in some form a few times.

11 Q. Are you telling us that your report is cut and pasted?

12 A. That's an easy way to type the same thing three times. I
13 do it all the time.

14 MR. VAN NEST: Now, do we have 293 up?

15 (Document displayed)

16 BY MR. VAN NEST:

17 Q. 293, that's also part of your infringement analysis in
18 your opening report, correct?

19 A. Yes.

20 Q. And again here, you say:

21 "As a final example, the function
22 'dvmResolveString' determines or resolves
23 symbolic references to numeric references
24 stringIdx."
25 Right?

1 A. That's what this says.

2 Q. And it's pretty clear from this sentence that you are
3 referring to stringIdx as an numeric reference, right?

4 A. Yes. As far as I can see, this is the same issue as I
5 corrected.

6 Q. And this issue, as you put it, is using an index, which
7 you're now calling a symbolic reference, describing it as a
8 numeric reference in your report, correct?

9 A. Apparently, here. There are other places in the report
10 where I'm clear about it, an Idx being a symbolic reference.

11 Q. And, obviously, that's the key issue with respect to
12 Resolve.c, whether or not the index that you have identified in
13 the instructions is a symbolic reference or an numeric
14 reference; right?

15 A. Apparently, this has turned out to be the key issue. It
16 never occurred to me that this would be read that way.

17 MR. VAN NEST: I have nothing further, your Honor.

18 THE COURT: Thank you.

19 **REDIRECT EXAMINATION**

20 BY MR. JACOBS:

21 Q. Professor Mitchell, you said there were other places in
22 your report where you were clear on what an index was in the
23 context of the analysis of the '104 patent.

24 What paragraphs did you have in mind?

25 A. I was thinking of Paragraph 252.

1 **MR. JACOBS:** Your Honor, could we show 252 as a prior
2 consistent statement?

3 **THE COURT:** All right. Let's put it on the screen.
4 (Document displayed)

5 **BY MR. JACOBS:**

6 **Q.** And could you read Paragraph 252, please, to the jury?

7 **A.** Sure.

8 "Android Optimize.c, Line 643, resolves the
9 field index in the constant pool to, among
10 other things, a byte offset in the field of
11 the object. Android Optimize.c, Lines 662 to
12 663, changes the OpCode to the desired quick
13 OpCode and the argument to the quick bytecode
14 in the byte offset of the field."

15 **Q.** Professor Mitchell, were there other places in your report
16 where you were clear that an index was a symbolic reference?

17 **A.** I expect so.

18 **Q.** Take a look at 258.

19 (Document displayed)

20 **Q.** Do you see the language at the end of your -- of the
21 sentence there?

22 **A.** Yes.

23 **Q.** And are Android branches to LOP_IGET_resolve, to resolve
24 the field index?

25 **A.** Yes.

1 Q. And what were you saying there about what the field index
2 was?

3 A. So the field index is a symbolic reference. All the
4 resolution here that I'm discussing is resolution of symbolic
5 references to produce numeric references.

6 Q. Could you take a look at Paragraph 283, please?

7 A. Sure.

8 (Brief pause.)

9 A. Yes.

10 Q. Does Paragraph 283 indicate that you were treating a field
11 index, fieldIdx, as a symbolic reference?

12 MR. VAN NEST: Objection. Leading, your Honor, on
13 these.

14 THE COURT: Sustained.

15 BY MR. JACOBS:

16 Q. What does Paragraph 283 indicate about your treatment of
17 indexes as symbolic references?

18 A. 283 also says:

19 "A function" -- in this case another resolve
20 function -- "determines or resolves symbolic
21 references, instance fields, to numeric
22 references, your pfieldId, and obtains data
23 in accordance with the numerical reference,
24 the field resField."

25 So this clearly says that the symbolic references

1 are instance fields or fieldIdx, for example, and the numeric
2 reference is a resField. The same terminology that I used in
3 my slides yesterday.

4 **MR. JACOBS:** Could we have the Court's claim
5 construction, Mr. Lee, Slide 17 from Dr. Mitchell's slides.

6 (Document displayed)

7 **BY MR. JACOBS:**

8 **Q.** Professor Mitchell, could you read the Court's claim
9 construction aloud please?

10 **A.** Yes.

11 "Symbolic reference, a reference that
12 identifies data by a name other than the
13 numeric memory location of the data, and that
14 is resolved dynamically rather than
15 statically."

16 **Q.** Why is a field index to a table not a numeric reference?

17 **MR. VAN NEST:** Objection, leading.

18 **MR. JACOBS:** It's a "why," your Honor.

19 **THE COURT:** Overruled. It's not a leading question.
20 Please answer.

21 **A.** The field indexes and other indexes are part of the
22 instructions. They are part of the code and they are names
23 that are used when there is data as the program runs to find
24 the location of data, but they, themselves, are not the
25 location of the program data in any sense.

1 BY MR. JACOBS:

2 Q. Is a constant pool index data in the sense that you were
3 just describing it? Constant pool data in the sense that you
4 were just using the term?

5 A. No. The constant pool entry such as field indices --
6 field names, other things that are names from the source code
7 are not program data. They are part of the program.

8 Q. And when you say they are part of the program, what do you
9 mean?

10 A. Those are portions of the program that a programmer writes
11 that are represented in a certain way in the Dalvik bytecode.

12 Q. When you say "represented in a certain way," represented
13 by what?

14 A. Field and other indices into the list of names.

15 Q. And that list of names is stored in what?

16 A. There are various kinds of names. The field index is a
17 name in one sense, and in another sense you follow that to find
18 the original name that the programmer used to name that field
19 when they were writing the code.

20 Q. And then how do you get to the data, the location of the
21 data that's referred to in the Court's claim construction?

22 A. Right. So the data that's relevant here is the data that
23 the program uses when the program runs. So you have an
24 operation to add the values of two fields. The data really are
25 the two operands to that add the two field values that are

1 going to be added together by the program.

2 The way that those values of the field are found is
3 by using the symbolic reference to find a numeric reference.
4 The numeric reference then is the address of that data as the
5 program runs, and when the address of the data as the program
6 runs is found, then the data values can be used and added
7 together.

8 **MR. JACOBS:** Mr. Lee, can you put up Figure 1A of the
9 '104 patent.

10 (Document displayed)

11 **BY MR. JACOBS:**

12 **Q.** Now, Dr. Mitchell, you were asked about this on
13 cross-examination, and Mr. Van Nest highlighted "slot 2 equals
14 17" and then he instructed his technician to unhighlight the
15 "17."

16 Do you recall that?

17 **A.** Yes.

18 **Q.** And what's the significance of the 17 in that table "Data
19 Object"?

20 **A.** The 17 is actually the data value. As a program like
21 this, the .c program runs, slot two is not stored anywhere.
22 That's just part of the illustration.

23 **Q.** What is the 17, sir?

24 **A.** 17 is the data.

25 **Q.** And so with reference to the dispute about whether the

1 field index or the class index is a symbolic or a numeric
2 reference, what was the significance of Mr. Van Nest telling
3 his technician to unhighlight "17"?

4 **A.** I'm not really sure. Maybe he was trying to suggest that
5 the first part of it was data.

6 **Q.** Exactly. So is the field index that gets you into the
7 constant pool table, does it -- would it get you to the 17 in
8 this illustration? Without resolving the symbolic reference?

9 **THE COURT:** I don't understand the question. Please
10 rephrase the question.

11 **BY MR. JACOBS:**

12 **Q.** Your testimony is that a field index is a symbolic
13 reference; correct, sir?

14 **A.** Yes.

15 **Q.** And why is the field index a symbolic reference looking,
16 at this chart Fig. 1A and the 17 on that slot two on the right?

17 **A.** Okay. There is no field index in this, so I'll try to
18 explain the best I can.

19 A field index is a name that's used to find a
20 description of the location of the data, but that description
21 has to be further interpreted and understood with respect to
22 some other data structures to find the actual data value.

23 **Q.** And the actual data value in Fig. 1A is for slot two?

24 **A.** 17.

25 **Q.** Does field index -- does an ifield index or a class index,

1 all these fields at 0000, do they point to a data value like 17
2 in the data object on Fig. 1A?

3 **MR. VAN NEST:** Objection. Misstates the claim
4 construction, your Honor. We're now outside the Court's claim
5 construction.

6 **MR. JACOBS:** We're right within the Court's claim
7 construction.

8 **MR. VAN NEST:** No, we're not.

9 **THE COURT:** I've told the jury. The jury knows what
10 the claim construction is. That's why we have juries, because
11 they will be able to see exactly what is going on and
12 understand the claim construction, understand the evidence, put
13 it all together.

14 And so I don't need to sustain that objection. This
15 is why the two excellent lawyers are fighting it out.

16 Please answer the question. Overruled.

17 **BY MR. JACOBS:**

18 **Q.** Let's take a look at Fig. 1B, Dr. Mitchell.

19 **MR. JACOBS:** I think it's back a little bit.

20 (Document displayed)

21 **BY MR. JACOBS:**

22 **Q.** Again, what is the 17 in this figure?

23 **A.** 17 is the data value in one of the data objects that
24 exists in the data memory of the executing program.

25 **Q.** And how does that correspond to the Court's claim

1 construction and its reference to the word "data"?

2 **A.** That is the data that this load instruction requires.

3 **Q.** And does -- do these indices to the tables in the constant
4 pool by themselves direct you to data like the 17 in Fig. 1A or
5 Fig. 1B?

6 **A.** No. This is not in any sense a numeric reference to that
7 data. It does not give you -- it is not the location of that
8 data.

9 **Q.** Now, Mr. Van Nest asked you some questions about static
10 versus dynamic and suggested that we had not told -- given the
11 jury the whole piece of Mr. Bornstein's statements.

12 **MR. JACOBS:** I would like to put up slide 18 from my
13 opening statement, Mr. Lee.

14 (Document displayed)

15 **BY MR. JACOBS:**

16 **Q.** And is the static linking language that Mr. Van Nest asked
17 you about on this slide?

18 **A.** Yes, it is.

19 **Q.** So we're looking at TX 816, Mr. Bornstein's talk. And he
20 says:

21 "...so as an example of static linking before
22 when a DEX file arrives."

23 Do you see that?

24 **A.** Yes.

25 **Q.** And Mr. Van Nest was asking you how it could be that

1 dexopt dynamically resolves symbolic references when
2 Mr. Bornstein refers to static linking in his presentation; do
3 you recall that?

4 **A.** Yes.

5 **Q.** What is your opinion on why dexopt dynamically resolves
6 symbolic references notwithstanding Mr. Bornstein's reference
7 to static linking?

8 **A.** Yeah. I think this characterization on the slide is
9 inaccurate. There are a number of reasons why this is a
10 dynamic process. It requires runtime information from the
11 runtime environment.

12 As I -- the class name, for example, refers to a
13 location of a class loaded into memory. The position of a
14 class in memory depends on how classes are loaded into the
15 specific phone or device. So there is runtime information
16 that's necessary in order to do this resolution.

17 **Q.** And therefore?

18 **A.** Therefore, it's a dynamic operation.

19 It's also implemented in the Dalvik Virtual Machine,
20 in the dexopt that uses the same code as the -- or overlapping
21 code with the bytecode interpreter.

22 This isn't done, couldn't be done during dx tool on
23 the developer's platform, as I believe Andy McFadden explained.
24 So it's really a dynamic runtime environment optimization.

25 **Q.** Turning to the '520 patent, Dr. Mitchell.

1 **MR. JACOBS:** Could we have Slide 57 from Dr.
2 Mitchell's slides up, Mr. Lee?

3 (Document displayed)

4 **BY MR. JACOBS:**

5 **Q.** So this is Claim 1 of the '520 patent. Does a requirement
6 that you use a stack appear -- to simulate execution appear in
7 the claim language?

8 **A.** No.

9 **Q.** Does simulating execution of the bytecodes occur in the
10 dx tool?

11 **A.** Yes.

12 **Q.** And why does that -- why is it your opinion that
13 simulating execution of the bytecodes occurs, notwithstanding
14 Google's argument that pattern matching or parsing, whatever it
15 is, is not simulation?

16 **A.** Yeah, there are a number of reasons.

17 First, it just corresponds to my understanding of
18 simulation, the code steps through the bytecode instructions to
19 see what they do, and it keeps track of information needed in
20 order to produce the simplified instructions.

21 Second, the Google programmers who wrote this called
22 it simulate and simulator and explained it that way as well.

23 **Q.** And Mr. Van Nest asked you questions about the fact that
24 the parse function appears in a separate file; do you recall
25 that?

1 A. Yes.

2 Q. Isn't that relevant to the question whether simulation is
3 occurring in static initialization?

4 A. I don't think that has anything to do with it. Typically
5 people, when they write a lot of code, organize it in various
6 ways. The organization doesn't have anything to do with the
7 functionality of the code, the way it operates or the way
8 different portion the code interact.

9 Q. Is code in a simulation -- in a class name simulation used
10 during static initialization?

11 Sorry. Let me start over again. What is the
12 relationship between the parse code and the simulate code in
13 the files that you described in your direct testimony?

14 A. Yeah. So the code in the simulator class in
15 simulator.java calls parse methods in order to parse the
16 instructions to understand what they do so they can be
17 simulated.

18 MR. JACOBS: No further questions, your Honor.

19 THE COURT: Anything more?

20 MR. VAN NEST: Just a few your Honor.

21 RECROSS EXAMINATION

22 BY MR. VAN NEST:

23 Q. Dr. Mitchell, when other classes in the code call
24 parseNewarray, are they simulating, too?

25 A. I don't know. I didn't look at those.

1 Q. Okay. So you know there are other classes in the dx tool
2 that call parseNewarray. You don't know whether they are
3 simulating or not, right?

4 A. I didn't look into other code that uses that same code.

5 Q. So parse array can be used for a lot of different things?

6 A. I don't know. I didn't have any reason to look into that.

7 MR. VAN NEST: Now, can we put up Paragraph 252 from
8 Dr. Mitchell's report? It was just up a minute ago.

9 (Document displayed)

10 BY MR. VAN NEST:

11 Q. Counsel asked you for some examples of where you got
12 things right.

13 Now, in 252 you don't actually use the word "symbolic
14 reference" or "numeric reference" there, right?

15 A. That's true. This is a short paragraph. It does say
16 "resolve."

17 Q. But it doesn't say "symbolic," it doesn't say "numeric;"
18 correct?

19 A. Correct.

20 Q. Let's go to the other example he gave you, 258.

21 MR. VAN NEST: Can we go to that?

22 (Document displayed)

23 BY MR. JACOBS:

24 Q. 258. It also doesn't use the word "symbolic reference" or
25 "numeric reference," as you did in 269 and 272 and 279, right?

1 A. It's true that this short sentence paragraph doesn't
2 contain "symbolic" or "numeric reference."

3 Q. Can you point us to any paragraph in the hundreds of
4 paragraphs in your opening report where you call a field index
5 or a class index or a method index or a string index anything
6 other than a numeric index?

7 A. Well, I think, for one example, it's quite clear in the
8 code comments and the code itself that that's the case, and
9 there --

10 Q. Dr. Mitchell, that was not my question.

11 My question was: Is there anywhere in your report in
12 the paragraphs that you wrote where you call a class index or a
13 field index or a method index or a string index anything other
14 than a numeric reference?

15 A. I think you changed your question. In answering that
16 question, I don't recall. I can't point you now to a specific
17 sentence.

18 MR. VAN NEST: Now, can we put the Court's claim
19 construction up, please? It's his 17. His revised slide 17.

20 (Document displayed)

21 BY MR. VAN NEST:

22 Q. And I think you told us earlier that a class index, which
23 is what you're now calling a symbolic reference, that points to
24 a location in a table in memory; right?

25 A. No. I think you asked that and I said no, because of the

1 memory issue.

2 Q. Okay. It points to a location in a table; would that be
3 correct?

4 A. Position in the table, yes.

5 Q. A position. And we saw the example in the field index of
6 it pointing to position zero, correct?

7 A. Yes.

8 Q. And the only reason that you're not conceding that that's
9 a numeric reference is that in the way Android works, that
10 initial table doesn't have the ultimate data that you're
11 looking for, correct?

12 A. No.

13 Q. That table also has a reference to another table, correct?

14 A. It's correct that one table has a reference to another.

15 Q. And typically the next table has a reference to another
16 table, right?

17 A. In the Dalvik bytecode dex file format there can be a
18 sequence of indices, yes.

19 Q. But the only thing that this classIdx points you to is a
20 position in another table, right?

21 A. That's its immediate value, yes; but that's not its entire
22 meaning, no.

23 Q. Excuse me?

24 A. That's not its entire meaning and use, no.

25 Q. But its initial value is to another table?

1 A. That's the first step in which it's used, yes.

2 MR. VAN NEST: I have no further questions, your
3 Honor.

4 THE COURT: May the witness step down?

5 MR. JACOBS: I have one more question your Honor.

6 FURTHER REDIRECT EXAMINATION

7 BY MR. JACOBS:

8 Q. Could you look at Paragraph 250 of your report, please?

9 (Witness complied.)

10 A. Yes.

11 Q. And could you read Paragraph 250 aloud, please?

12 MR. JACOBS: Again, your Honor, this is a prior
13 consistent statement I?

14 THE COURT: All right. Go ahead.

15 A. (As read)

16 "To be clear, Android Optimize.c Line 196
17 identifies integer field fetch instructions
18 in a switch statement and Android's
19 Optimize.c Line 201 shows a decision to
20 change the integer field fetch instruction to
21 the corresponding quick instruction. In this
22 process, a symbolic reference is resolved to
23 a numerical reference. Android Optimize.c
24 Line 235 shows how instruction is changed by
25 calling RewriteInstField (the rest of this

1 method handles integer field puts, static
2 field gets and puts, and invoke
3 instructions)."

4 **BY MR. JACOBS:**

5 **Q.** Thank you, Professor Mitchell.

6 **MR. JACOBS:** No further questions your Honor.

7 **THE COURT:** All right. You may step down.

8 (Witness excused.)

9 **THE COURT:** May we now have our next witness?

10 **MR. JACOBS:** Yes. We call Dan Bornstein.

11 **THE COURT:** Is this your last witness?

12 **MR. JACOBS:** Yes, it is.

13 **THE COURT:** All right.

14 **DANIEL BORNSTEIN,**

15 called as a witness for the Plaintiff herein, having been first
16 duly sworn, was examined and testified as follows:

17 **THE WITNESS:** I do.

18 **THE COURT:** Very well. Welcome back.

19 Please have a seat, and you know how the microphone
20 works.

21 **DIRECT EXAMINATION**

22 **BY MR. JACOBS:**

23 **Q.** Mr. Bornstein, we meet again.

24 Whose idea was Dalvik?

25 **A.** That was my idea.

1 Q. When did you start working on it?

2 A. Umm, not long after starting at Google.

3 Q. When did you start at Google?

4 A. October of 2005.

5 Q. It's true that when a developer writes an Android
6 application in the Java programming language, he or she first
7 uses a Java compiler to compile the source code into Java class
8 files?

9 A. That's the -- I would say that's the usual way that it
10 happens.

11 Q. But the Dalvik Virtual Machine cannot run Java class
12 files?

13 A. That's correct.

14 Q. So the Java class files must first be translated into an
15 Android dex file to be run on Dalvik?

16 A. That's correct.

17 Q. The dx tool is the program that translates Java class
18 files to a dex file?

19 A. That's correct.

20 Q. And you wrote the dx tool?

21 A. I wrote the first version of it.

22 Q. Files with Dalvik bytecode are called .d-e-x files?

23 A. I would usually say .dex files.

24 Q. In Dalvik, the Dalvik VM executes Dalvik bytecode that's
25 stored in the dex files.

1 A. Say that again?

2 Q. The Dalvik Virtual Machine executes Dalvik bytecode in dex
3 files?

4 A. The -- yeah. The virtual machine takes the bytecode
5 that's inside the dex file.

6 Q. You designed the Dalvik bytecode format?

7 A. Yeah. I designed the bytecode format and I also designed
8 the container format.

9 MR. JACOBS: May I, your Honor?

10 (Whereupon, document was tendered
11 to the witness.)

12 BY MR. JACOBS:

13 Q. 736. Already admitted.

14 (Document displayed)

15 Q. This is the Dalvik executable format, the format of
16 the .dex file, correct?

17 THE COURT: Is that coming through over there in the
18 jury box.

19 (Jury responding affirmatively.)

20 THE COURT: Good, thank you.

21 A. I'm sorry. What was the question?

22 BY MR. JACOBS:

23 Q. This is the -- a description of the executable format for
24 Dalvik, correct?

25 A. This is the format for the container -- a specification

1 for the container format.

2 Q. And when you say the "container format," you mean the file
3 structure in which dex code outputted by the dx tool would be
4 deposited?

5 A. If I understood you correctly, yes.

6 Q. Could you say it more technically precisely?

7 A. So what I would say is that this describes -- when I say
8 the "container format," there is several different sections of
9 things that are in a dex file, so this is describing those.

10 It's not a full description. There is another
11 document that describes in particular the bytecode instruction
12 format. That's not covered by this document.

13 Q. So this is a description of those containers?

14 A. Of the dex file container format.

15 Q. Google makes a Software Development Kit available online
16 to the public, an SDK?

17 A. Is that a question?

18 Q. Yes.

19 A. As far as I know, it does.

20 Q. And the SDK is a development tool for writing and testing
21 Android applications?

22 A. That's also a question?

23 Q. Yes.

24 A. Okay. You said it's a tool for? Sorry.

25 Q. The Android SDK is a development tool for writing and

1 testing Android applications?

2 **A.** I think that's fair to say.

3 **Q.** When the developer downloads the SDK, the SDK comes with
4 the dx tool?

5 **A.** Actually, I'm not 100 percent sure about that. The way
6 that the SDK gets delivered has changed over time. I'm not
7 sure if you directly would get dx when you just download the
8 SDK.

9 **Q.** And if you didn't get it that way, how does a developer
10 get it?

11 **A.** Just to be clear, I'm not the guy or one of the guys who
12 put together the SDK. So, you know, take it with a grain of
13 salt.

14 But my understanding is that when you get the SDK,
15 that's sort of a shell and you can load add-ons into that
16 shell. For example, for different -- different versions of the
17 platform. And it may only be when you get a specific version,
18 that you would get a version of dx along with that.

19 **Q.** And you do need dx in order to write Android applications?

20 **A.** I wouldn't say you need it. I would say it's typically
21 used.

22 **Q.** Is there any alternative to a dx tool to -- available to
23 developers to convert the output of a Java compiler into dex
24 code?

25 **A.** Well, that's a different question than what you were

1 asking before.

2 Q. That's my question.

3 A. Okay. So, wait. Which question is your question?

4 Q. The one I just asked you, sir.

5 A. Sorry.

6 Q. Is there an alternative -- if you're writing an
7 application for Android and you want to convert the code
8 from -- that's output by the Java compiler so it will run on an
9 Android phone, isn't it true that you need to get a dx tool?

10 A. Again, that's not the question that you asked before.

11 You --

12 THE COURT: Well, he's asking it now, for goodness
13 sakes. Come on. Answer that question.

14 A. So, no, you don't need dx to produce a dex file.

15 BY MR. JACOBS:

16 Q. What's the alternative?

17 A. It's actually well-specified, as you point out. Any
18 developer can write code to create a dex file. And there's
19 other tools out there that create dex files.

20 Q. Typically developers that you're aware of have downloaded
21 the dx tool to create Android applications?

22 A. As I said before, I would say the typical thing is that
23 you would use it, but it's not necessary.

24 Q. Application developers, including Google application
25 developers, can get a system image as part of the Android SDK;

1 true?

2 A. Again, you know, I think when you get the SDK to begin
3 with, you might not have that. But I think it's -- again, my
4 understanding is you can load -- get that as sort of an add-on.

5 Q. The system image?

6 A. My understanding, yes.

7 Q. An Android system image is something that developers can
8 use with an emulator to test their applications as if they are
9 running on an Android device; true?

10 A. An Android -- say that again, please? Sorry.

11 Q. An Android system image is something that developers can
12 use with an emulator to test their applications as if they are
13 running on an Android device?

14 A. If I understood you correctly, yes.

15 Q. To build Android system binaries, Android developers use
16 the Java -- who are writing in the Java programming language
17 use the Java compiler and then the dx tool to create Android
18 system binaries?

19 A. Sorry. What's the question?

20 Q. Did Google write the Google Maps application for Android?

21 A. As far as I know, Google engineers worked on the Google
22 Maps application.

23 Q. Is Google Maps an application made by Google, sir?

24 A. As far as I know, it is.

25 Q. Did Google write the Android market's Google Play

1 application for Android?

2 **A.** Well, as far as I know, the Google Play application per se
3 happened -- got developed after I left Google, so I can only
4 guess.

5 **MR. JACOBS:** Your Honor I would like to read
6 Mr. Bornstein's deposition, 30(b)6 deposition, from July 22nd,
7 2011, Page 21, Lines 7 to 10.

8 **THE COURT:** Go ahead.

9 **BY MR. JACOBS:**

10 **"QUESTION:** The Android market app for
11 Android, was that app written by Google?

12 **"ANSWER:** I believe that most of that work
13 was done within Google."

14 **A.** You said "Google Play." That's -- from my perspective,
15 that's a different -- I understand that it's a -- that's also a
16 market application, but it looks like -- from my perspective as
17 someone who is no longer on the Google project, that looks like
18 a different application to me. That's why I answered what I
19 answered.

20 **Q.** Did Google use the dx tool to build Google applications
21 for Android?

22 **A.** Did Google use dx?

23 **Q.** Yes.

24 **A.** I think that was pretty common, certainly.

25 **Q.** The dx tool that Google uses internally to build

1 applications has the same functionality as the dx tool that
2 external developers typically use, correct?

3 A. I'm sorry. Say that again?

4 Q. The dx tool that Google uses internally has the same
5 functionality as the dx tool that external developers typically
6 use, correct?

7 A. As far as I know, yes.

8 Q. And you were offered by Google to testify on this topic as
9 a company representative; do you recall that, sir?

10 A. I do.

11 Q. And you testified that by and large you would expect the
12 function of the dx tools as used internally by Google and
13 externally by developers to be about the same; correct, sir?

14 A. That's right.

15 Q. And you stand by that testimony?

16 A. I do.

17 Q. Google has an Android developer's website for developers
18 who write applications for Android; true or false?

19 A. A developer website?

20 Q. Yes.

21 A. Yes.

22 Q. And Google tells developers how to install the Android
23 SDK; true or false?

24 A. I believe there are instructions on installing the SDK.

25 Q. Google tells developers -- you believe or not, or do you

1 know, sir?

2 **A.** I haven't looked at the website lately. I have not looked
3 at the website lately.

4 **Q.** But at the time you were at Google, that was the case?

5 **A.** I believe it was.

6 **Q.** It was or it wasn't, sir?

7 **A.** Umm, you know, I didn't spend my time looking at that
8 website. I would be surprised if there weren't instructions
9 for installing, but, you know, my job was spent on other parts
10 of the system.

11 **Q.** Google tells developers how to develop Android
12 applications using the SDK; true or false?

13 **A.** I believe that's correct.

14 **Q.** Google tells developers how to build and run applications
15 for Android using the SDK?

16 **A.** I believe that's correct as well.

17 **Q.** Let's take a look at 757.

18 (Document displayed)

19 **Q.** It's already in evidence.

20 **MR. JACOBS:** May I, your Honor?

21 **THE COURT:** Yes.

22 (Whereupon, document was tendered
23 to the witness.)

24 **BY MR. JACOBS:**

25 **Q.** 757 has a flowchart showing how Android -- the SDK builds

1 applications; true, sir?

2 A. You're referring to the thing on the first page?

3 Q. Yes -- no, sorry, Page 2.

4 A. Oh, I'm sorry.

5 (Brief pause.)

6 A. What's the question?

7 Q. There is a flow chart showing how the Android SDK builds
8 applications; true or false?

9 A. Yeah, that's what looks like is intended by this.

10 Q. And if you go to the next page, there is a reference to
11 the "dx tool." Do you see that?

12 "The dx tool converts the class files to
13 Dalvik bytecode."

14 A. I would say that's a misstatement.

15 Q. That's what it says there, sir, correct?

16 A. I do see that it says that.

17 Q. You gave a presentation about the Java Virtual Machine at
18 Google IO in 2008; true?

19 A. Correct.

20 Q. I'm going to show you Exhibit 32, which has been admitted.

21 (Document displayed)

22 Q. And ask you if that is the -- and ask you if those are
23 your presentation slides?

24 MR. JACOBS: Oh, I'm sorry. Here it is. May I, your
25 Honor?

1 **THE COURT:** Yes.

2 (Whereupon, document was tendered
3 to the witness.)

4 **A.** One moment please.

5 (Brief pause.)

6 **BY MR. JACOBS:**

7 **Q.** Sir, are those your presentation slides?

8 **A.** So far it looks like it.

9 **Q.** Okay. Now, let me show you 225.

10 **MR. JACOBS:** May I, your Honor?

11 **THE COURT:** Yes.

12 (Whereupon, document was tendered
13 to the witness.)

14 **BY MR. JACOBS:**

15 **Q.** And those are your presentation slides with your speaking
16 notes; correct, sir?

17 (Document displayed)

18 **A.** Just a second, please.

19 (Brief pause.)

20 **A.** It looks like it.

21 **Q.** And if you look at Slides 50 to 56, you gave advice on how
22 to write efficient programs; correct, sir?

23 **A.** 50 through to 56?

24 **Q.** Yes.

25 **A.** Do you mean where it says -- do you mean by the page

1 number?

2 Q. "Optimizing Your Code" is on 50 of 77 of the document.

3 A. Okay. Let me get there.

4 (Brief pause.)

5 A. Okay.

6 Q. Optimizing the code means writing efficient code; correct,
7 sir?

8 A. What I would say is optimizing code is -- means taking
9 code that may not be efficient and making it more efficient.

10 Q. And you wrote in your speaking notes:

11 "Now that you know a little more about the
12 design of the virtual machine, I want to take
13 a couple minutes to talk about optimizing
14 your code for mobile devices and for Dalvik
15 in particular."

16 Correct, sir?

17 A. I see that in my notes. I'm not sure I said exactly that.

18 Q. (As read)

19 "The really big difference is the battery.
20 If you do anything, that means you consume
21 the milliwatts and though the battery
22 technology continues to get better, it's
23 still a far cry from the practically
24 limitless energy you can get by plugging into
25 a wall."

1 Do you see that?

2 A. I see that.

3 Q. And that's true, isn't that?

4 A. It is true that mobile devices are operating on battery.

5 Q. And it's true that if you do anything, that means you
6 consume the milliwatts; true, sir?

7 A. Yes. Performing work on a battery-operated device means
8 using some amount of the capacity of the battery.

9 Q. Now, if you look at slide 7 of 77?

10 A. Oh, so back to the beginning?

11 (Document displayed)

12 Q. Yes. And it's also on the screen if you want to let us
13 help you speed up.

14 A. I see. Okay.

15 Q. That slide says that:

16 "The Dalvik Virtual Machine is designed to
17 run on a slow CPU with relatively little
18 Ram."

19 That's memory; right, sir?

20 A. Ram is the -- the active, the most active memory of a
21 device.

22 Q. And then it concludes:

23 "While powered by a battery."

24 Do you see that?

25 A. I do.

1 Q. And that was true; correct, sir?

2 A. Yes.

3 Q. And then on Slide 10.

4 (Document displayed)

5 Q. You noted:

6 "There is a problem with memory efficiency."

7 True, sir?

8 A. That's the header on the slide, yeah.

9 Q. And the problem here that you're addressing is the limited
10 memory that was available on hand held devices; true, sir?

11 A. Yeah, that was the general topic of that slide.

12 Q. At the time that you gave this presentation, the total
13 amount of memory that you had available to you was 64
14 megabytes?

15 A. That was an example.

16 Q. And after the services have started up, you're left with
17 only 20 megabytes of memory; true, sir?

18 A. Again, that was meant as an example, not a measure of
19 reality.

20 Q. You were designed to illustrate the point to your
21 application developers that they have to worry about memory
22 usage; correct, sir?

23 A. That's fair to say.

24 Q. After the large system libraries are loaded, you're left
25 with 10 megabytes of memory in your example; correct, sir?

1 A. Keep in mind that this is about outlining a potential
2 problem that -- I mean, so what you're describing is how I set
3 up the problem statement.

4 Q. And the problem statement was intended not to be alarmist,
5 but to be realistic; correct, sir?

6 A. It -- what it was meant to convey was the idea that you
7 would have to do something in order to make the system work
8 well.

9 MR. JACOBS: Let's turn to Slide 41, please?

10 (Document displayed)

11 BY MR. JACOBS:

12 Q. Now, Slide 41 --

13 A. Sorry. Hold on just a second, please.

14 (Brief pause.)

15 Q. We're in Exhibit 225 and we've got your speaking notes
16 there; right, sir?

17 A. Yes.

18 Q. And in Slide 41 your speaking notes titled the slide
19 "Static Array Initialization;" true, sir?

20 A. That's not the title.

21 Q. The first speaking note was "Static Array Initialization;"
22 correct, sir?

23 A. That's what it says, yes.

24 Q. (Indicating.)

25 A. That is what it says.

1 Q. And you meant to say to yourself, "When I get to this
2 slide, I should say this is static array initialization"?

3 A. What that's meant is that if you look at the code, see how
4 it says static? Then a couple words later there is a pair of
5 square brackets? So it's introducing what in the Java
6 programming language would be called a static array
7 initialization.

8 Q. The example on slide 41 shows a slide of integers; true,
9 sir?

10 A. That's right.

11 Q. Seven elements of integers?

12 A. Uh, yep.

13 Q. And the word "static" means that the array size is fixed
14 when it's created; true, sir?

15 A. No. That's not what the word "static" means.

16 Q. To -- the word "static" in "static array initialization"
17 doesn't mean that, sir?

18 A. No, that's not what "static" means in that --

19 Q. To "initialize an array" means to assign values to each
20 element of the array; true, sir?

21 A. What was that, again?

22 Q. "To initialize an array" means to assign values to each
23 element of the array?

24 A. Uhm, that's -- I think that's fair to say.

25 Q. And in Android, this array of seven integers is first

1 compiled into Java bytecode; true, sir?

2 A. Sorry, say again.

3 Q. In Android -- let's look at slide 42.

4 A. Okay. Slide 42, okay.

5 Q. And that's the result of compiling that array of 7
6 integers into Java bytecode; true, sir?

7 A. I believe that's what I did, uhm, to get the listing in
8 slide 42.

9 Q. And then in your speaking notes you're discussing the
10 usage of memory that this results in; true, sir?

11 A. Hold on. I didn't -- haven't read the notes. Just a
12 second. This is more about the size -- the size of the
13 executable as opposed to the memory used by the -- by running
14 it. There's a little bit of a difference.

15 Q. There's a little bit of a difference, but the size of the
16 code here is relevant to memory usage; true, sir?

17 A. Yes. Yes, it is.

18 Q. And, in fact, then, if you go to slide 44, you see the
19 translation to Dalvik bytecode instructions; true, sir?

20 A. Hold on. Okay. Okay. Sorry. Yes.

21 Q. And there's an instruction there that's called
22 "fill-array-data"; true, sir?

23 A. Yes, yes.

24 Q. And that's the one Dalvik bytecode instruction needed to
25 initialize all the array elements; true, sir?

1 A. Technically, I would say there's two instructions needed.
2 There's the fill-array-data, and then there's the array data
3 instruction that it refers to.

4 Q. Now, you actually recorded the presentation you gave with
5 these slides; true, sir?

6 A. I didn't record it myself.

7 Q. It was recorded?

8 A. I believe it was.

9 MR. JACOBS: So can I play clip 1, please, of Exhibit
10 816, Mr. Lee.

11 (Video deposition clip played in open court; not
12 reported.)

13 MR. JACOBS: And then let's play clip 2, Mr. Lee.

14 (Video deposition clip played in open court; not
15 reported.)

16 BY MR. JACOBS:

17 Q. So the functionality that you were describing in this
18 portion of your presentation saved something like a hundred K?

19 A. That's correct.

20 Q. And that was significant enough to put in your
21 presentation?

22 A. I felt it was worth putting in.

23 Q. Do you take pride in your code writing?

24 A. Uhm, I would say in general, yes.

25 Q. You write high-quality code, and you're meticulous and

1 careful to get the details right?

2 **A.** I think you're reading from my self-evaluation.

3 **Q.** I am, sir.

4 **A.** Well, a self-evaluation is meant to, you know, puff
5 oneself up a bit.

6 **Q.** Were you puffing yourself up, or were you describing what
7 you do?

8 **A.** I was trying to paint what I do in a positive light.

9 **Q.** Do you pride yourself on the lucidity of your code?

10 **A.** Again, I think you're just reading what I wrote in my
11 self- --

12 **Q.** You meant to be accurate; correct, sir?

13 **THE COURT:** You've got to answer the question.

14 **THE WITNESS:** I did take --

15 **THE COURT:** Is it true or not true?

16 **THE WITNESS:** I do take pride in my code.

17 **THE COURT:** That's the answer.

18 Next question.

19 **BY MR. JACOBS:**

20 **Q.** And you try to be deliberate in your code, in fixing
21 architectural flaws as you notice them?

22 **A.** Correct.

23 **Q.** You document as you go?

24 **A.** I try to.

25 **Q.** And you believe what you have produced for Android, as of

1 December 11, 2006, was high quality, understandable, and
2 maintainable; true, sir?

3 **A.** I also believe that.

4 **Q.** You started working on the dx tool in December 2005, true?

5 **A.** That sounds about right.

6 **Q.** You wrote that you started work on the stimulator, the
7 code which can run through the bytecode and keep track of the
8 contents of local arrays and the execution step, in your -- let
9 me just show you the document.

10 **MR. JACOBS:** May I, Your Honor?

11 (Document tendered to the witness)

12 **THE WITNESS:** Just a second.

13 **MR. JACOBS:** Put it up. It's 1095. It's been
14 admitted.

15 (Document displayed.)

16 **BY MR. JACOBS:**

17 **Q.** (As read:)

18 "Started work on the simulator, the code
19 which can run through the bytecode and keep
20 track of the contents of local arrays and the
21 execution step."

22 Do you see that?

23 **A.** Actually, I believe you misspoke.

24 **Q.** You:

25 "Started work on the simulator, the code

1 which can run through bytecode, and keep
2 track of the contents of local arrays and the
3 execution stack"?

4 **A.** I believe you misspoke again.

5 **Q.** Where did I misspeak, sir?

6 **A.** You said "local," not "locals."

7 **Q.** Ah, "locals arrays." That's not a typo?

8 **A.** No, that's not a typo.

9 **Q.** So you keep track of the contents of locals arrays and the
10 execution stack?

11 **A.** Yeah. In the Java bytecode format, the execution model
12 consists of a stack and a locals array. And that's what that's
13 referring to.

14 **Q.** And this part of your snippet reminder is referring to
15 your work on the dx tool?

16 **A.** Uhm, it is.

17 **Q.** And you're familiar with Simulator.java and
18 BytecodeArray.java in Android; true, sir?

19 **A.** I'm sorry, say that again. Simulator.java and --

20 **Q.** BytecodeArray.java.

21 **A.** You mean in the dx tool?

22 **Q.** Yes.

23 **A.** Yes.

24 **Q.** You wrote them?

25 **A.** I wrote the first versions of them.

1 Q. Simulator.java is a later version of the simulator you are
2 referring to in your snippet?

3 A. I'm sorry, say again.

4 Q. I'll move on.

5 MR. JACOBS: May I, Your Honor?

6 THE COURT: Yes.

7 BY MR. JACOBS:

8 Q. Handing you 46.16 and 46.17, both admitted.

9 (Document displayed.)

10 Q. Now, if you turn on 46.16, on page 1, line 37 --

11 A. Page 1 -- sorry?

12 Q. Line 37.

13 A. Just a second. Yes.

14 Q. You described Simulator.java as a class which knows how to
15 simulate the effects of executing bytecode; true, sir?

16 A. I see that, yes.

17 Q. And that was a true statement?

18 A. I think that's a reasonable colloquial statement.

19 Q. When you say it's "a reasonable colloquial statement," do
20 you mean to be suggesting it's not accurate, sir?

21 A. What I mean to suggest is that comments are meant to
22 orient programmers. Programmers will not always say the
23 super -- most super technically accurate things in order to be,
24 you know, say, efficient with their word usage.

25 So that's -- I would say that saying is a reasonable

1 shorthand that would let, actually, myself know, or other
2 people who work on the code, know what that's about.

3 Q. You didn't intend to mislead with that sentence?

4 A. I did not mean to mislead, no.

5 Q. Now, the comment for the second method in this -- In
6 46.16, at lines 110 and 111 ...

7 A. Okay. Yes.

8 Q. Says:

9 "Simulate the effect of the instruction at
10 the given offset, by making appropriate calls
11 on the given frame."

12 Do you see that?

13 A. I see that.

14 Q. And that's an accurate description of what this method
15 does?

16 A. Hold on just a second. Let me look at it.

17 I actually have to look back at where the visitor --
18 uhm, if -- I think that's a reasonable statement.

19 Q. Did you intend it to be accurate at the time, sir?

20 A. I did.

21 Q. Now, you used the term "simulate" -- and "simulator" and
22 "simulate" as colloquial terms understood between engineers,
23 correct?

24 A. I did.

25 Q. Now, the first simulate method that we looked at on the

1 first page, at line -- I'm sorry, on this page, at line 99,
2 calls the parseInstruction method over a block of bytecode,
3 correct?

4 A. Hold on. So you want me to look at line 99?

5 Q. Yes.

6 A. Okay. What's the question?

7 Q. The first simulate method calls the parseInstruction
8 method over a block of bytecode; true, sir?

9 A. It calls -- so there's a loop there. And inside that loop
10 is a call to the parseInstruction method.

11 Q. And the parseInstruction method parses an instruction out
12 of the block of bytecode; true, sir?

13 A. Well, uhm, I think -- so we have to look back at the
14 definition for code. So code is -- okay.

15 Back on line 56 you'll see the declaration
16 BytecodeArray code. So code there is an instance of
17 BytecodeArray. And then we'd want to look at the
18 implementation of the parseInstruction in BytecodeArray, to see
19 what that's doing.

20 Q. Let me just ask it again, sir. The parseInstruction
21 method parses an instruction out of a block of bytecode; true
22 or false?

23 A. Uh, I believe that's what -- I think that's a reasonable
24 statement to say.

25 Q. And by "reasonable statement" you mean it's accurate what

1 I just said, sir?

2 **A.** Again, I would again say speaking colloquially, that's a
3 reasonable way to describe what it's doing.

4 **MR. JACOBS:** Your Honor, I would like to real from
5 Mr. Bornstein's deposition, May 16, 2011, lines 9 to 14, at
6 page 208.

7 **THE COURT:** Please, go ahead.

8 **MR. JACOBS:** (As read:)

9 **"QUESTION:** Would you agree that the
10 parseInstruction method knows how to do that,
11 to understand the bytes in the string?

12 **"ANSWER:** I think it's reasonable to say that
13 what the parseInstruction method is doing is
14 parsing an instruction out of this
15 BytecodeArray object."

16 **BY MR. JACOBS:**

17 **Q.** Do you stand by that testimony, sir?

18 **A.** Yes, I do.

19 **Q.** Now, the parseInstruction method is implemented in
20 BytecodeArray.java; true, sir?

21 **A.** Yeah, I believe that's what I was just noting.

22 **Q.** And turning to BytecodeArray.java, the parseInstruction
23 method calls other methods depending on the parse Java
24 bytecode; true, sir?

25 **A.** Let's look. If I recall correctly, yes. We can certainly

1 look at it. It's right here.

2 **Q.** Let me skip you ahead, Mr. Bornstein. I'll take your
3 answer that you've given so far.

4 Would you agree that one of the things the
5 `parseNewarray` method does is parse the new array bytecode and
6 the following bytecode, to identify array initialization?

7 **A.** I think you're -- sounds like you're reading off a comment
8 there. I think, again, that's a reasonable colloquial
9 statement.

10 **MR. JACOBS:** Your Honor, I would like to read
11 Mr. Bornstein's deposition, page 211, lines 8 to 16.

12 **THE COURT:** Go ahead.

13 **MR. JACOBS:** (As read:)

14 **"QUESTION:** Would you agree that what the
15 method does is parses the new array bytecode
16 and the bytecode that follows it to identify
17 an array initialization?

18 **"ANSWER:** I would say that it is among the
19 things that it does. It's possible for it to
20 do a pattern match on a sequence of bytes
21 that match a particular pattern that can be
22 understood as array initialization."

23 **BY MR. JACOBS:**

24 **Q.** Do you stand by that testimony?

25 **A.** I do.

1 Q. For example, if a new array bytecode is followed by a
2 bytecode for initializing an array of integers, this method
3 expects the following pattern repeatedly: dupe push index push
4 value *astore. True?

5 A. Again, that's a little bit of a shorthand.

6 Q. But it's true, sir, correct?

7 A. Uhm, yeah. Fair to say.

8 Q. The parse array method checks to see which array index it
9 is dealing with; true, sir? I'm on page 17 of TX 46.17, line
10 972.

11 A. Okay. Hold on. Sorry, what line number?

12 Q. Line 972.

13 A. 972. Okay. That's a comment.

14 Q. It's an accurate comment; true, sir?

15 A. Uh, I would nitpick with it.

16 Q. Did you intend it to be accurate at the time that you
17 wrote it?

18 A. I didn't write that code.

19 Q. Take a look, sir.

20 A. All right. No, I didn't write this one.

21 Q. Take a look at whether it's accurate then.

22 A. As I said, I would nitpick with the comment.

23 Q. It's substantially accurate?

24 A. Uhm, well, I think -- so if you read what the comment
25 says, comment says:

1 "Next check if the expected array index is
2 pushed to the stack."

3 There is no actual pushing going on in the code, if
4 you look at the code. So that's why I would say it's not
5 really accurate.

6 Q. You finished implementing the fill-array-data function for
7 the dx tool in March or April of 2008?

8 A. Well, I was the tech lead for it. I would say that's when
9 that was implemented. Sounds about right.

10 Q. Are you familiar with the Compatibility Test Suite for
11 Dalvik, sir?

12 A. In general, yes.

13 Q. And is it true that the Dalvik bytecode specifications
14 list fill-array-data as one of the instructions in the Dalvik
15 bytecode?

16 A. I'm sorry, say again.

17 Q. The Dalvik bytecode specification lists fill-array-data as
18 one of the instructions?

19 A. Yes, I believe so, yes.

20 Q. And the Dalvik bytecode specification states that
21 fill-array-data fills the given array with the indicated data?

22 A. Uhm, that sounds about right, yeah.

23 Q. And then there's a test in the Compatibility Test Suite
24 called "test fill-array-data.java." Are you familiar with that
25 test?

1 A. I'm not surprised that such a test exists. I'm not
2 particularly familiar with that code.

3 Q. It tests for proper execution of fill-array-data Dalvik
4 bytecode; true, sir?

5 A. As I said, I'm not particularly familiar with it. I would
6 go by the name.

7 Q. That that's what it does?

8 A. I would take it at face value just based on the name. But
9 I'm not familiar with the code.

10 Q. Google has Compatibility Test Suites for the dx tool;
11 true, sir?

12 A. Oh, for the dx tool?

13 Q. Yes.

14 A. Uhm, I don't know that there's actual compatibility tests
15 for dx, so much as for the -- for the virtual machine.

16 Q. You were asked by Mr. Brady, at one point, to help him
17 understand why you needed to test the actual dx tool for CTS;
18 true, sir?

19 A. Honestly, I don't remember.

20 MR. JACOBS: May I, Your Honor?

21 THE COURT: You may.

22 MR. JACOBS: 1001. I believe it's in. Yes? No?

23 BY MR. JACOBS:

24 Q. It's an e-mail that you were party to; correct, sir?

25 A. Looks like it's an e-mail from me.

1 **MR. JACOBS:** Offer 1001 into evidence.

2 **MR. PAIGE:** No objection, Your Honor.

3 **THE COURT:** 1001, did you say?

4 **MR. JACOBS:** Yes.

5 **THE COURT:** All right. Received in evidence.

6 (Trial Exhibit 1001 received in evidence.)

7 **BY MR. JACOBS:**

8 **Q.** So this is an e-mail in which you were asked to help the
9 team understand why there was an actual dx test tool needed for
10 the Compatibility Test Suite; true, sir?

11 **A.** So, hold on just a second.

12 So I think at the time there was -- I'm sorry.

13 **Q.** Go ahead.

14 **A.** So, okay. In the end, I don't think a test of dx per se
15 ended up being part of the CTS. Although, I believe tests of
16 dx were produced.

17 I would say that at this point in time, I think there
18 was -- I think I probably had a lack of clarity of the
19 distinction between the CTS and just sort of testing in
20 general.

21 I think, certainly, it's -- I could -- I could have
22 worded what I wrote better, to be sure.

23 **Q.** Well, let me see if you recognize what ultimately
24 eventually ended up. I would like to show you 47.24 and 47.25,
25 which have not yet been admitted.

1 May I approach?

2 **THE COURT:** You may.

3 **THE WITNESS:** Okay.

4 **BY MR. JACOBS:**

5 **Q.** Do you recognize those files, sir?

6 **A.** Uhm, I don't recognize them specifically.

7 **Q.** Do you recognize them by their file path?

8 **A.** Oh, I see -- okay. So I do actually see something where
9 it's labeled "dx tests." I didn't remember that those were
10 around.

11 **Q.** And it's in a folder called "CTS." Do you see that?

12 **A.** I do see that.

13 **Q.** So that indicates that it's part of the Compatibility Test
14 Suite?

15 **A.** That's reasonable.

16 **Q.** And, in fact, it tests `NewArray.java`; correct, sir?

17 **A.** Well, can you point me to a line.

18 **Q.** Well, right to the top. "Tests `NewArray.java`."

19 **A.** Okay. Oh, sorry, I was looking -- looking at the other
20 one.

21 So the thing that I would really have to see is the
22 context in which this was used. The source code itself, you
23 know, on the face of it doesn't test new array.

24 You can actually see that there's references to other
25 classes. So like look at line 20 -- I'm sorry, line 30, you'll

1 see --

2 Q. Let me ask you a simple question. I can maybe shortcut
3 your analysis, Mr. Bornstein.

4 Does the file, "CTS tools, dx tests ... test
5 NewArray.java," in fact, test NewArray.java?

6 A. As I way saying, we would have to look at the code behind
7 the classes that it uses, to know what it's actually testing.

8 Q. In the presentation that we looked at earlier, you talked
9 about the dexopt tool; true, sir?

10 A. Yeah, I believe so.

11 Q. And, in fact, you talked about the other -- about
12 optimizing dex files when they land on the device; true, sir?

13 A. I believe I did.

14 MR. JACOBS: So let's play clip 3, Mr. Lee.

15 (Video deposition clip played in open court; not
16 reported.)

17 BY MR. JACOBS:

18 Q. Now, a dex file might have symbolic references to methods
19 and fields when it arrives on a device; true, sir?

20 A. That's right.

21 Q. And dexopt can resolve them into simple integer vtable
22 offsets; true, sir?

23 A. Dexopt will do resolution of various sorts.

24 Q. Will dexopt resolve the symbolic references -- will dexopt
25 resolve symbolic references into simple integer vtable offsets?

1 A. Not all symbolic references.

2 Q. So when you wrote "when a dex file arrives on" -- when you
3 said, "When a dex file arrives on a device it will have
4 symbolic references to methods and fields, but afterwards it
5 might just be a simple integer vtable offset," you meant to be
6 conveying that, in many cases, the symbolic reference will be
7 resolved by dexopt?

8 A. That's right.

9 Q. And some resolution has to take place by Dalvik during
10 interpretation; true, sir?

11 A. It can happen during the interpretation.

12 Q. So dexopt does some of the resolution, and then there's
13 additional symbolic reference resolution that's done during the
14 execution of the bytecode interpreter?

15 A. If I understood correctly, yes.

16 Q. Is there any ambiguity in my question, Mr. Bornstein?

17 A. Uhm, I -- not that I'm aware of, but I'm not perfect.

18 Q. Now, the application installer causes dexopt to process
19 dex files, true?

20 A. Sorry, say that again.

21 Q. The application installer causes dexopt to process dex
22 files?

23 A. I think that's reasonable. I'm not super familiar with
24 that layer, but I think that's reasonable.

25 Q. And the package manager service invokes the dexopt tool,

1 also; doesn't it, sir?

2 **A.** Again, not -- that wasn't the area that I worked on, but
3 that's my understanding.

4 **Q.** And the package manager service is written in Java?

5 **A.** I believe that's mostly written in Java. That might not
6 be a hundred percent.

7 **Q.** The package manager service runs on a Dalvik Virtual
8 Machine?

9 **A.** Uhm, the -- yeah, I think that's fair to say.

10 **Q.** So dexopt processes dex files while the Dalvik Virtual
11 Machine is running?

12 **A.** Well, so, there's --

13 **Q.** True or false, sir?

14 **A.** Uhm, I think there's -- there's sort of an implication
15 that you're making there, that makes it hard to answer that.

16 **Q.** Does -- the package manager service runs on a Dalvik
17 Virtual Machine?

18 **A.** Uhm, so the package manager is in one process doing
19 resolution, perhaps, running dexopt, but for a different
20 application that it is not running.

21 **Q.** But dexopt processes dex files while the Dalvik Virtual
22 Machine is running in that process?

23 **A.** In that process, that's fair to say.

24 **MR. JACOBS:** 1094. May I approach?

25 **THE COURT:** Yes.

1 **MR. JACOBS:** Not yet in evidence.

2 **BY MR. JACOBS:**

3 **Q.** Mr. Bornstein, are you a "Dalvik people" on that e-mail
4 distribution list?

5 **A.** I probably am.

6 **MR. JACOBS:** Offer 1094 into evidence.

7 **MR. PAIGE:** No objection.

8 **THE COURT:** Received.

9 (Trial Exhibit 1094 received in evidence.)

10 **THE COURT:** You did not offer 47.24, 47.25.

11 **MR. JACOBS:** I offer those into evidence.

12 **THE COURT:** Any objection?

13 **MR. PAIGE:** No objection, Your Honor.

14 **THE COURT:** Received.

15 (Trial Exhibits 47.24 and 47.25 received in
16 evidence.)

17 **BY MR. JACOBS:**

18 **Q.** Now, this is an e-mail from October 25, 2008. Do you see
19 that?

20 **A.** I do.

21 **Q.** And in it there's a question, the HTC guy says, why does
22 dexopt need to be run -- need to be done at runtime? "Couldn't
23 it be done in compile time?"

24 Do you see that?

25 **A.** Hold on. Actually, can you point me at what you're

1 looking at.

2 Q. Scroll down to the bottom. Look down at the bottom of the
3 e-mail.

4 A. Oh, okay. Oh, I see.

5 Q. And he's asking, why can't we do dexopt when we run the dx
6 tool; true, sir?

7 A. Uhm, I'm not entirely sure what he's trying to ask.

8 Q. Well, you -- Ben, on your team, gives an answer; true,
9 sir?

10 A. I see that.

11 Q. And he says, go take a look at Dalvik/docs in the open
12 source tree for more details.

13 "The following is extracted from the document
14 (thanks to fadden) to give you a high-level
15 idea why some of these optimizations can only
16 be performed at runtime."

17 Do you see that?

18 A. I see that.

19 Q. And he's referring to running the dx tool -- I'm sorry,
20 he's referring to running dexopt; true, sir?

21 A. Wait, wait. Who's referring to running dexopt?

22 Q. Well, Ben is.

23 A. Wait. Hold on just a second.

24 MR. PAIGE: Objection. Foundation, Your Honor.

25 THE WITNESS: Oh, sorry. I see it.

1 **THE COURT:** Overruled. Please answer.

2 **THE WITNESS:** So, actually, I think you were saying
3 that Ben wrote something. But it looks like the initial one is
4 actually from David Turner. So I think David Turner is saying
5 something about dexopt. Ben is saying something else.
6 Something maybe -- maybe a little more general.

7 The formatting of this is a little wonky.

8 **BY MR. JACOBS:**

9 **Q.** Well, do you see the second bullet?

10 "For instance field get/put, replace the
11 field index with a byte offset."

12 Do you see that?

13 **A.** Yeah, that looks like something that dexopt would do.

14 **Q.** So he is explaining why that -- replacing the field index
15 with a byte offset reference resolution, he's explaining why
16 that optimization can only be performed at runtime; true, sir?

17 **A.** Uh, I think he's mistaken.

18 **Q.** But that is what he's saying; true, sir?

19 **A.** I mean, that's what this says, but I think he's wrong.
20 I'm not sure what the deal is. But, I mean, this is describing
21 what dexopt does. And, actually, when the application is
22 running, it doesn't do that.

23 **Q.** So he's mistaken, sir? The guy on your team doesn't
24 understand that dexopt is running at what might be referred to
25 as runtime?

1 A. I believe if you -- as written, this is just not right.

2 Q. Or you're using a meaning of runtime that's different from
3 a member of your team is using for runtime; true, sir?

4 A. Uhm, I think -- I think he was just -- I think he must
5 have just been confused. I really do.

6 Q. A member of your team is confused about when dexopt runs,
7 sir?

8 A. Nobody is perfect.

9 MR. JACOBS: Stipulate to that.

10 THE COURT: Is this a good time for a break?

11 MR. JACOBS: Just a minute, Your Honor.

12 Your Honor, I have no further questions.

13 THE COURT: All right. Well, let me ask, how long
14 will your examination be on your side?

15 MR. PAIGE: In response to Mr. Jacobs' questions,
16 probably not much more than five or ten minutes.

17 THE COURT: How much?

18 MR. PAIGE: Not more than five or ten minutes, I
19 would think, Your Honor.

20 MR. VAN NEST: Your Honor, we are going to call
21 Mr. Bornstein first in our case, so this is a fine time to take
22 break, if you would like to.

23 THE COURT: We're going to take a 15-minute break at
24 this time. Please remember the admonition.

25 THE CLERK: All rise.

1 (Jury out at 11:03 a.m.)

2 **THE COURT:** Be seated. Anything the lawyers need me
3 for?

4 **MR. JACOBS:** Not from us, Your Honor.

5 **MR. VAN NEST:** We have one thing, Your Honor --

6 **THE COURT:** What's that?

7 **MR. VAN NEST:** -- in response to your question.

8 **MR. BABER:** This is just our hand-up, Your Honor
9 (indicating). I said I would do a hand markup of your
10 description of Java Language.

11 **THE COURT:** Yes. And, also, Mr. Jacobs said he was
12 going to give me another package so I could do a side-by-side
13 comparison. You thought that the math package was too simple,
14 and you were going to give me a more complicated one. I'm
15 happy to read that.

16 **MR. JACOBS:** Let me check at the break, Your Honor,
17 on the status of that.

18 **THE COURT:** Okay. We'll take our 15-minute break at
19 this time.

20 (Recess taken from 11:04 to 11:19 a.m.)

21 **THE COURT:** Please be seated.

22 Are we ready to bring in the jury?

23 **MR. JACOBS:** Quick item, Your Honor. I said at
24 the -- when you asked, that this would be our last witness
25 subject to our offline discussion.

1 And I meant to be referring to the possibility that
2 we would reconfigure on willfulness Phase Three versus Phase
3 Two.

4 So we will be resting after Mr. Bornstein. But,
5 obviously, if we do something differently on willfulness we'll
6 have to have a conversation about whether we need to put on any
7 more evidence.

8 **THE COURT:** Well, you always have the right to just
9 wait, wait until Phase Three. You have not given up your
10 opportunity to prove that case yet.

11 **MR. JACOBS:** Understood, Your Honor.

12 **THE COURT:** All right. So let's bring in our jury.
13 (Jury enters at 11:22 a.m.)

14 **THE COURT:** Please be seated.

15 Are we ready?

16 **MR. PAIGE:** Yes, Your Honor.

17 **THE COURT:** Please remind the jury who you are.

18 **MR. PAIGE:** Gene Paige, Your Honor, on behalf of
19 Google.

20 **THE COURT:** Go right ahead.

21 **MR. PAIGE:** Thank you, Your Honor.

22 **CROSS EXAMINATION**

23 **BY MR. PAIGE:**

24 **Q.** Mr. Bornstein, good morning.

25 **A.** Hi.

1 Q. I just want to ask you a few questions to follow up on
2 what Mr. Jacobs asked you about just now.

3 You recall that he asked you whether the dx tool
4 operates on class files produced when you run through a Java
5 compiler?

6 A. I do.

7 Q. And is the Java compiler only available from Oracle?

8 A. No. There's at least a few different Java compilers
9 around.

10 Q. What other Java compilers are there?

11 A. There's one that comes with this tool called Eclipse.
12 There's one called the JiX compiler, that comes out of IBM. I
13 know there's more than that. Those are the ones I can think of
14 offhand.

15 Q. And those produce the same sort of Java bytecode that the
16 Java compiler available from Oracle does?

17 A. Yeah.

18 Q. If you could turn to Exhibit 225, Mr. Jacobs questioned
19 you about, please. And he had asked you about slide 10. It
20 starts out with "Memory efficiency."

21 (Document displayed.)

22 A. Is it 10?

23 Q. Yes.

24 A. 10, right.

25 Q. And there's a figure there, on slide 10, of 64 megabytes

1 for total system RAM?

2 A. That's right.

3 Q. And this presentation was given when?

4 A. In 2008, early.

5 Q. What sort of RAM is there on Android devices nowadays?

6 A. I think a gigabyte is not uncommon for RAM these days.

7 Q. And what's a gigabyte compared to 64 megabytes?

8 A. So a gigabyte is a thousand megabytes. So it's not 10 --
9 it's not a hundred times. It's like -- it is 60-ish times.
10 Something like that. It's a lot bigger.

11 Q. Okay. And you were asked some questions about a statement
12 that was made during your presentation about a speed and a
13 space efficiency win. That's on slide 45. If you could look
14 at it.

15 A. 45?

16 Q. Yes.

17 A. Okay.

18 Q. And do you see the notes there that says it saves about a
19 hundred K?

20 A. I do.

21 Q. How large are the core framework external libraries?

22 A. Uhm, at the time that I was doing this, their total was
23 about 10 megs.

24 Q. 10 megabytes?

25 A. 10 megabytes, yes.

1 Q. How does that compare to 100 kilobytes?

2 A. 100K is about 1 percent of that.

3 Q. Now, let's take a look at some of the source code you were
4 shown. If you could look at 47.16, Simulator.java.

5 A. 47 dot -- sorry.

6 Q. 16.

7 A. I see 46.16. I see 46.17.

8 Q. I'm sorry, 46.16.

9 MR. VAN NEST: 46.16. 46.

10 BY MR. PAIGE:

11 Q. And if you see on the first page of that, line 37, there's
12 a class which knows how to simulate the effects of executing
13 bytecode?

14 A. Yes.

15 Q. In that class, is there -- does it sometimes simulate
16 bytecode by manipulating a stack?

17 A. It does.

18 Q. Okay. And then in 46.17, that's BytecodeArray.java,
19 right?

20 A. Yes.

21 Q. And if you'll turn there to page 17, please.

22 A. Uh-huh.

23 Q. Mr. Jacobs asked you some questions about this, right?

24 A. Uhm, let's see. Yeah, I think he got into that territory.

25 Q. And the part following line 948, where it says "try to

1 match the array initialization idiom" --

2 A. I see that.

3 Q. -- does that simulate anything by manipulating a stack?

4 A. It doesn't.

5 Q. What does it do?

6 A. It does a pattern match.

7 Q. You were asked some questions, as well, about some code in
8 the CTS. Do you recall those questions?

9 A. I do.

10 Q. And if you could look at 47.24.

11 A. Okay.

12 Q. Can you tell by looking at that bytecode whether it would
13 be able to determine how an array, a fill-array-data
14 instruction was created?

15 A. Well, I mean, this isn't bytecode. This is just source
16 code. And you can't really -- without a larger context of like
17 how this is getting -- how this code here is being built and
18 run, you can't really tell much of anything.

19 Q. Okay. Now, we heard a presentation that you gave back in
20 2008, where you referred to when a dex file arrives on the
21 phone it will have symbolic references. Do you recall that?

22 A. I do.

23 Q. So I'd like to ask you some questions about that
24 statement. Before I do, can you tell the jury, what makes up a
25 bytecode instruction?

1 A. Uhm, yeah. A bytecode instruction consists of an opcode,
2 and then sometimes one or more things called operands. So
3 together the opcode plus the operands makes up a bytecode
4 instruction.

5 Q. So what is an opcode?

6 A. An opcode, "opcode" stands for -- short for operation
7 code.

8 It's just a number. And the number indicates how,
9 uhm, like when you -- when you should execute an instruction,
10 that opcode indicates what operation the instruction should be.

11 So like if you're going to be adding two numbers,
12 there's a couple of opcodes that represent addition. That's an
13 easy one to think about.

14 There's also if you're, say, going to do some sort of
15 testing or comparison, there are various testing and comparison
16 opcodes. Things along those lines.

17 Q. And what's an operand?

18 A. An operand is -- when you get down to it again, it's just
19 a number. At least in Dalvik bytecode. And the number has a
20 different meaning, depending on the opcode.

21 So, you know, again, like in the case of addition,
22 an -- one of the operands might just be a number to add. Or it
23 might be -- it might name a variable that you are -- you know,
24 indicate a variable that -- that is to be added to. Or in
25 Dalvik terms that would be a register.

1 Q. You said in the presentation that dex files contain
2 symbolic references, correct?

3 A. I believe I did.

4 Q. Are the symbolic references in the bytecode instructions
5 themselves?

6 A. No. No, they are not.

7 Q. Where are they stored in the dex file?

8 A. The dex file has a series of sections in it -- well, in
9 general, a dex file consists of a series of sections. Some of
10 those sections are designated as lists of references.

11 If you look back at the dex file spec, they're these
12 tables that are named like string_id or type_id or proto_id.
13 "Id" was the shorthand I ended up using. And the spec referred
14 to the -- you know, those lists of references.

15 Q. And why are they in tables rather than in the
16 instructions?

17 A. Well, one of the things that I wanted to do when I
18 designed the bytecode instruction format was to make sure that
19 each instruction had a fixed layout.

20 So anytime there was anything that could have been --
21 call it stretchy, I would end up making that be outside the
22 instruction stream, with -- with, I guess, one notable
23 exception, but in particular all of the references fell into
24 that category.

25 So what you'll see is there's a number, an operand,

1 for the instructions for the opcodes that needed to have this
2 kind of reference. That number just sort of points to sort of
3 like a location within one of those -- within one of those
4 reference lists.

5 Q. Now I'd like to ask you a few questions about Exhibit 225,
6 that Mr. Jacobs had shown you.

7 A. Okay.

8 Q. Specifically, slide 35 of that exhibit.

9 A. Hold on. Let's see. 225, okay. Sorry. Slide 35?

10 Q. Yes.

11 A. Okay.

12 (Document displayed.)

13 Q. And who wrote these slides?

14 A. I was the main author. I think I took input from a bunch
15 of folks but I -- I'd say it was mine.

16 Q. What is slide 35 referring to?

17 A. Okay. So you look at the title. It says, "Install-Time
18 Work."

19 So this is all about what happens like when you, say,
20 as a user, go to install an application on your phone. So a
21 lot of work happens on Android during that act.

22 So this is at the level of the Dalvik VM. This is
23 sort of outlining a little bit of what happens.

24 Q. And what specifically is happening here?

25 A. Uhm, well, so you can see the five bullet items.

1 There's -- I think those were sort of like the five most
2 significant things.

3 Really, there's a lot of stuff happening. But in
4 general, the optimization that this is referring to is work
5 that you can do that -- it's like -- it's -- this is all stuff
6 that you can do by sort of looking at the environment of -- of
7 the device, and sort of adapting the code that it finds to that
8 environment.

9 Q. And what specifically does these optimizations?

10 A. So there's a tool called "dexopt," that performs this
11 stuff.

12 Q. And if you could look at bullet two underneath
13 optimization.

14 A. Uh-huh.

15 Q. That says "static linking." What is static linking?

16 A. Static linking is -- so this is, I guess, a more specific
17 case of what I was just talking about, where when you look at
18 what's on a device, one of the things that's on a device is the
19 set of libraries.

20 And libraries are -- I mean, I guess I talked about
21 them in the slides that -- that you saw. Libraries are bodies
22 of code that are used by applications. The idea is that if
23 there's something that's used pretty commonly or that requires
24 some special set of facilities, that might be put into a
25 library on a device. And for any given device, the libraries

1 won't be identical.

2 So once an application is sitting there on a device,
3 well, now you know exactly what libraries it's going to be
4 using because they are like right there.

5 And static linking is sort of looking at those,
6 looking at those existing libraries, looking at the app, and
7 saying, oh, this little thing that's in this app, I know that
8 really refers to this specific thing in this specific library.

9 And it makes -- in the case of static linking, it
10 makes edits to the code in the application that kind of --
11 well, link -- the term "link" is pretty descriptive there. It
12 sort of links it in -- at least that linked version is
13 inextricably linked to that --

14 **THE COURT:** This has gotten so long, we need to ask a
15 new question.

16 **THE WITNESS:** I'm sorry.

17 **THE COURT:** Too long an answer. Try to limit your
18 answers to about three or four paragraphs.

19 The next question, please.

20 **BY MR. PAIGE:**

21 **Q.** Does static linking occur when the program is running,
22 Mr. Bornstein?

23 **A.** No. It happens during install time, which is before it
24 would run.

25 **Q.** Now, if you could turn to Exhibit so 1095, that Mr. Jacobs

1 showed you.

2 **A.** Let's see. Okay.

3 (Document displayed.)

4 **Q.** And you explained that that was something referring to a
5 early version of the dx tool, right?

6 **A.** Yeah, from late 2005, that would be.

7 **MR. PAIGE:** Okay. May I approach, Your Honor?

8 **THE COURT:** You may.

9 **BY MR. PAIGE:**

10 **Q.** Mr. Bornstein, I've handed you Exhibit 262, which I
11 believe is in evidence.

12 (Document displayed.)

13 **Q.** And could you tell me what Exhibit 262 refers to.

14 **A.** Uhm, so this looks like an automated e-mail sent from the
15 bug tracking system. And the -- I think it's an indication
16 that the fill-array-data instruction has been like the -- all
17 the stuff about it has been finished.

18 **Q.** And when was that dated?

19 **A.** That's dated April 16th, 2008.

20 **Q.** So the fill-array-data instruction was completed around
21 April of 2008?

22 **A.** Yeah.

23 **Q.** When was the Android SDK first released?

24 **A.** I think that was November of 2007.

25 **Q.** So the fill-array-data instruction was not part of Android

1 as it was originally released, correct?

2 **A.** That's right.

3 **MR. PAIGE:** Thank you, Mr. Bornstein. I have no
4 further questions at this time.

5 **THE COURT:** Anything more?

6 **MR. JACOBS:** Briefly, Your Honor.

7 **REDIRECT EXAMINATION**

8 **BY MR. JACOBS:**

9 **Q.** Could you turn to 46.16, Mr. Bornstein.

10 (Document displayed.)

11 **A.** Oh, oh, I see.

12 **Q.** And I'm going to ask you to look at lines 110 through 119.

13 **A.** Hold on. The comment?

14 **Q.** Yes. So at 110, it says:

15 "Simulates the effect of the instruction at
16 the given offset, by making appropriate calls
17 on the given frame."

18 Do you see that?

19 **A.** I do.

20 **Q.** And then if we turn to the next page, there's the simulate
21 method; correct, sir?

22 **A.** That's right.

23 **Q.** And it invokes the parseInstruction in order to simulate;
24 correct, sir?

25 **A.** Uhm, well, invokes parse in order to do the parse. But

1 then the simulation happens back in code that's outside there.

2 You can think of it as a pipeline. So there's a
3 parsing -- there is a part which is parsing instructions, and
4 that's sort of feeding into the part that's doing the
5 simulation.

6 Q. So the simulate method invokes the parseInstruction as
7 part of the simulation process?

8 A. So -- yeah. I mean, so you can see here it's calling
9 parseInstruction to do the parsing. And that will do the
10 parsing. And that sort of, again, goes through that pipeline
11 to then do the actual simulation.

12 Q. You were asked a couple of questions about your slide dec.
13 And let's go back to that at 225.

14 A. Okay.

15 Q. Now, dexopt is part of the --

16 A. Wait, wait, wait. Please. Sorry. Is it 225?

17 Q. Yes.

18 A. Okay.

19 Q. Dexopt is part of the Dalvik Virtual Machine; correct,
20 sir?

21 A. In a larger sense, yes.

22 Q. And if you look at page 5 of 77, you circled the Dalvik
23 Virtual Machine on this diagram of Android because that was the
24 focus of your presentation; correct, sir?

25 A. That's right.

1 Q. And the Dalvik Virtual Machine is listed there under the
2 Android runtime; correct, sir?

3 A. That's right.

4 Q. Now, if you go to slide 11 of 77 --

5 A. Okay.

6 Q. Now, you acknowledged -- you said in your presentation
7 that there are symbolic references in a dex file; true, sir?

8 A. That's right.

9 Q. And where would the symbolic references that you were
10 referring to reside in this dex file anatomy?

11 A. You can see the sections called out. So under header --
12 I -- as I was saying earlier --

13 Q. Sir, I'm sorry. Real quickly, where would the symbolic
14 references reside in this dex file anatomy?

15 A. With all the things labeled under underscore ids. So,
16 string-ids, type_ids, proto_ids, field_ids, method_ids.

17 Q. And the actual data that is being recovered by the -- The
18 data for the program during execution, that resides in the data
19 portion of this file; true, sir?

20 A. I'm not sure what you mean by that.

21 Q. The data that the symbolic reference when resolved will --
22 will point to, the -- let me start over.

23 The symbolic reference is resolved, we agree, to a
24 numeric reference; true, sir?

25 A. Uhm, well, if you're talking about like what happens to do

1 that, like when you end up doing a method thing and it ends up
2 as a -- like a vtable offset.

3 Q. A vtable offset, exactly. Right?

4 A. That's what you were talking about?

5 Q. The vtable offset, where are those shown here, sir?

6 A. The vtable offsets aren't shown here.

7 MR. JACOBS: Thank you, sir. No further questions.

8 MR. PAIGE: Just one more, Your Honor.

9 RECROSS EXAMINATION

10 BY MR. PAIGE:

11 Q. Mr. Bornstein, looking at page 5 of your presentation --

12 A. Uh-huh.

13 Q. -- that Mr. Jacobs just directed you to --

14 A. Okay.

15 Q. It says, "Android runtime."

16 Is runtime different than the time when a program is
17 running?

18 A. Yeah.

19 MR. PAIGE: Thank you. No further questions.

20 THE COURT: May the witness step down? I guess until
21 the -- a few minutes later?

22 MR. PAIGE: He may step down and step back up, Your
23 Honor.

24 THE COURT: All right. Well, why don't we --

25 MR. VAN NEST: I think he ought to just remain there,

1 Your Honor. We are going to open our case in a moment.

2 **THE COURT:** Please, just have a seat again. I'm
3 sorry to do this to you.

4 **THE WITNESS:** I'm sorry.

5 **THE COURT:** All right. Mr. Jacobs.

6 **MR. JACOBS:** I think you want to hear: Plaintiff
7 rests, Your Honor.

8 **THE COURT:** Plaintiff rests.

9 We've reached a milestone in the case. Now, you know
10 how it works over there. We now go to the defense case.

11 All motions under Rule 50 will be deemed to have been
12 made right now. We will hear those at the end of today's
13 session.

14 At this time, the defendant Google may present its
15 defense.

16 **MR. VAN NEST:** Thank you, Your Honor. We will begin
17 by calling Mr. Bornstein, since he's here and warmed up.

18 **THE COURT:** Very good. Mr. Bornstein, you are still
19 under oath.

20 Let's go right to it. Please, proceed.

21 **MR. PAIGE:** Thank you, Your Honor.

22 **DANIEL BORNSTEIN,**
23 called as a witness for the Defendant herein, having been
24 previously duly sworn, was examined and testified as follows:
25

DIRECT EXAMINATION

BY MR. PAIGE:

Q. Mr. Bornstein, good morning again.

A. Good morning.

Q. Now, the jury already knows a bit about you, so I won't go into all of your personal background. But just to remind them, what was your role in the Dalvik project?

A. I was the technical lead and one of the individual contributors, one of the programmers who wrote the code for it.

Q. And let's talk a little bit about virtual machines, which we've been hearing a bit about in this part of the case.

What is a virtual machine?

A. In simple terms, a virtual machine is a program that runs other programs.

Q. And what are they used for, generally?

A. Uhm, they are used in all sorts of ways. The general shape of things is that a -- let's say you have -- any given program kind of expects or is written to expect a particular environment in which it runs. And a virtual machine is responsible for providing that environment so that the program can run successfully.

Q. How long have virtual machines been around?

A. Longer than I've been alive, I'm pretty sure.

Q. What was the first one that you personally used?

A. The first one that was really strongly called a virtual

1 machine, that I used, was probably this thing called UCSD
2 Pascal. It was an implementation for a language called Pascal.

3 Q. And when did that take place?

4 A. I think that would have been like 1980 or so, is when I
5 used it. I know it existed before that, as well.

6 Q. Have you ever written any virtual machines yourself?

7 A. I have.

8 Q. When did you write your first one?

9 A. Uhm, it would probably be like -- I'm not sure if it was
10 middle school or high school, but certainly my senior project
11 for high school, the thing that I did was -- was -- well part
12 of it was writing a virtual machine.

13 Q. And how does the time that you were writing your virtual
14 machines compare to the time in which the Java programming
15 language was released?

16 A. That would have been -- so Java was, I think, first
17 publicly released in 1994. I would have been doing my work in
18 like '84, '85, '86. Something in that range. I couldn't tell
19 you the exact year.

20 Q. How much virtual machines have you built over the course
21 of your career working in this field?

22 A. I don't know an exact number. It's probably something
23 like ten.

24 Q. So one of the virtual machines you've worked on is Dalvik,
25 correct?

1 A. That's right.

2 Q. What is the Dalvik Virtual Machine?

3 A. I'd say that the Dalvik Virtual Machine is the virtual
4 machine that is -- that -- that's part of the Android platform
5 that's used for running application code and parts of the
6 platform itself.

7 Q. And who named the Dalvik Virtual Machine?

8 A. I did.

9 Q. Where did the name come from?

10 A. It's named after a town in Iceland. The town is actually
11 named Dalvík, with an accent over the "i." Basically, I
12 Americanized it for use as a program name.

13 Q. How did you come up with that name?

14 A. Uhm, well, at the time, the project needed a name. I had
15 just finished reading a book of translated Icelandic fiction.
16 And I guess I sort of had Iceland in the back of my head. And
17 I thought, hey, wouldn't it be nice to have a place named in
18 Iceland be the name of this thing I'm working on?

19 And I looked at a map and found one that looked like
20 it would be memorable and pronounceable, and it became Dalvik.

21 Q. Who created the Dalvik bytecode language?

22 A. I developed it.

23 Q. And how long did it take to develop the Dalvik Virtual
24 Machine?

25 A. Uhm, well, so from inception through, say, the first

1 product, that was about three years. There was the SDK release
2 that was a year before that. And, of course, it's still an
3 ongoing project.

4 Q. How many people were working on it on the three years
5 until shipment, roughly?

6 A. I think it was like five or six people total. Something
7 like that.

8 Q. And how much of your time personally were you spending on
9 it during those three years?

10 A. That was like almost the entirety of my work effort during
11 that time.

12 Q. Now, the jury has heard something in the case about Apache
13 Harmony and core libraries. Was Dalvik created from open
14 source?

15 A. Uhm, no. I mean, the -- the main Dalvik code base was
16 written from scratch as part of Android.

17 Q. And was Dalvik created with help from companies like
18 Noser?

19 A. Uhm, you know, I think Noser may have submitted like a bug
20 report or a patch here or there. That wasn't their role.
21 Their role was on the library side.

22 So it really was like Google engineers working on the
23 VM implementation.

24 Q. Can you give me the names of the engineers who were
25 involved with the development of Dalvik?

1 A. Yeah. So, let's say up through the relevant time frame
2 there's me, a guy named Andy McFadden, a guy named Ben Chen, a
3 guy named Mike Flemming, a guy named Dave Port. And I think
4 that -- I think that about covers it.

5 Q. And you know, generally, who was on the Android team,
6 correct?

7 A. Uhm, yeah.

8 Q. Could you tell me if any of the following people were
9 involved with developing Android?

10 A. Okay.

11 Q. Robert Griesemer?

12 A. No.

13 Q. Frank Yellin?

14 A. No.

15 Q. Hurs Hoelzle?

16 A. No.

17 Q. Srdjan Mrtovich?

18 A. No.

19 Q. Todd Turnage?

20 A. No.

21 Q. David Stoutamire?

22 A. No.

23 Q. Ben Gomez?

24 A. No.

25 Q. None of those people were involved in developing Android?

1 A. Not as far as I know.

2 Q. Could you explain the differences between the Dalvik
3 Virtual Machine and a virtual machine that runs on Java
4 bytecode?

5 A. Yeah. The easiest things to point out are that
6 comparing -- if you, like, compare Java bytecode system to
7 Dalvik, the container formats for code are different. And
8 within that container format the bytecode instruction set is
9 different.

10 Q. And is one of them register-based?

11 A. Yeah, so it's often said that the Dalvik VM uses a
12 register-based machine, as opposed to the Java bytecode model,
13 which is -- it's sometimes called just a stack machine, but
14 it's -- I would say more accurate to say, it's a mixed model of
15 stack plus a locals array.

16 Q. How does a stack work?

17 A. Uh, well, we've got a stack right here. So take a look at
18 these folders (indicating). Stack.

19 Imagine that for some crazy reason the only thing I'm
20 allowed to do is take things off of the top of the stack. Or
21 put things on top of the stack (indicating). So like if I
22 wanted to get something way at the bottom, I wouldn't be able
23 to sort of go in and pull it out.

24 That gives you -- imagine that sort of sitting inside
25 the computer somehow. That will give you kind of an idea about

1 what -- what a stack is about.

2 Q. And what drives the differences between register-based
3 machines -- or drove the choice, rather, between a
4 register-based machine and a stack-based machine for Dalvik?

5 A. The main thing that I was aiming for was to be able to
6 implement an interpreter for the instruction set that was
7 particularly efficient. That was the main -- I would say that
8 was the primary goal. The secondary goal was to have an
9 efficient compiler. Or, more specifically, an efficient
10 just-in-time compiler.

11 Q. And how does using a register-based machine help with
12 that?

13 A. So there's two different answers for the two different
14 parts of that. So I'd have to talk a little bit about what
15 happens in an interpreter.

16 In an interpreter -- so, you know, we talked about
17 the bytecode instructions. So in an interpreter, the system is
18 reading each bytecode instruction at the time that it wants to
19 execute it. So it's reading. It's sort of looking at that
20 opcode, looking at those operands, and then deciding what to
21 do, and then doing it. And it does that repeatedly, over and
22 over again. That is what an interpreter does.

23 And there's a particular step in doing an interpreter
24 which is inefficient and is almost necessarily inefficient.
25 And that is the point where you look at the opcode and figure

1 out what that opcode is supposed to do. And that's called
2 dispatching an opcode.

3 Dispatching opcode is fairly inefficient. So if you
4 can do something where you have the same outcome, and -- but if
5 you do fewer opcode dispatches, then that will lead to a more
6 efficient -- you know, a more efficient interpreter.

7 And if you look at how instructions look in a stack
8 model compared to in a register model, it's reasonably
9 possible, and we did, pack kind of -- I would say it's sort of
10 like more semantics, more meaning into each instruction.

11 So in order to do the same thing, you had to execute
12 or you have to execute fewer instructions. And that leads to
13 better interpreter performance. That's on the interpreter
14 side.

15 On the Just In Time compiler side, if you look at
16 what a Just In Time compiler has to do when it is doing its
17 job, which is doing a translation of bytecode from one form
18 into a more efficiently executable one, at a slightly different
19 time during the life of a -- you know, during the life of the
20 code, if you compare what it would do in the stack model versus
21 the register model, in fact, it will typically have to do some
22 of that same kind of that translation from a stack model into a
23 register model exactly because the underlying hardware itself
24 tends to look more like the register model. So doing this --
25 by having this be in a register form in the first place, you

1 avoid that bit of work in the Just In Time compiler.

2 Q. When you were creating the Android project, was there ever
3 a consideration of not using a virtual machine at all?

4 A. Yes, there was.

5 Q. Would that have been a possible way to build the Android
6 project?

7 A. Yeah, it would have.

8 Q. Now, how does the Dalvik Virtual Machine use the Java
9 programming language? In what sense is it used?

10 A. I think I've talked about this a little bit, but a typical
11 thing for, say, an Android application programmer to do is
12 write code in the Java programming language, translate that
13 into Java.ClassFiles. Trade them in. Have those class files
14 translated into a dex file and then the dex file gets packaged
15 up with some other bits and pieces and becomes an Android
16 application.

17 So, you know, there is this Java source that's sort
18 of the original text that the programmer wrote, but by the time
19 it's -- by the time it's landed on a device, it's no longer
20 Java bytecode.

21 Q. Was there ever any discussion of using languages other
22 than the Java programming language as the primary application
23 language for Dalvik?

24 A. Yeah, that discussion did happen.

25 Q. What else did you consider?

1 A. The two main contenders back in the early days were C++
2 and Java script.

3 Q. And would C++ have used a virtual machine?

4 A. No. The way C++ is run isn't by anything anyone would
5 typically call a virtual machine.

6 Q. Now, you've talked a bit about translating the
7 instructions from Java bytecode to dex bytecode. Why is that
8 necessary?

9 A. Because the Dalvik Virtual Machine doesn't run Java
10 bytecode.

11 Q. And we had talked a little bit earlier about a class
12 called simulator.java.

13 A. Uh-huh.

14 Q. You wrote the first version of that, right?

15 A. That's right.

16 Q. What does that class do?

17 A. That class is -- it's responsible for having kind of, say,
18 an understanding in some way of the Java bytecode model. It
19 uses that understanding to produce -- well, it produces this
20 sort of intermediate form inside the dx tool that's more like
21 the Dalvik model.

22 Q. And does the simulator sometimes produce that by
23 simulating, manipulating the stack?

24 A. Yeah. There is -- so, you know, we didn't see the code
25 just now, but there is a -- there's a couple of classes

1 called -- they have "machine" in the name. So there is a
2 valuetype machine, a rocker machine and at least one or two
3 others. And the machine there is the representation of the
4 Java bytecode model, so we call it the Java machine model.

5 And that -- part of that machine model is an
6 execution stack and the other part is the locals array.

7 Q. And the parseNewarray functionality we had looked at
8 earlier, does that make any manipulations on a stack when
9 determining what the initial values of the array should be?

10 A. No.

11 Q. If you could turn to Exhibit 225, please?

12 A. Okay.

13 (Witness complied.)

14 Q. We looked at Slide 42 earlier.

15 A. Okay.

16 (Document displayed)

17 Q. Slide 42 is what happens when you run static array through
18 the Java compiler, right?

19 A. Yeah. So -- yeah, that was -- I guess 41 was the original
20 source code. 42 was the snippet of bytecode that corresponded
21 to that.

22 Q. And 42 shows a repeated pattern?

23 A. That's right.

24 Q. Now, if you could take a look at Slide 43, which we
25 haven't looked at before?

1 A. Okay.

2 (Witness complied.)

3 Q. Could explain what Slide 43 does?

4 (Document displayed)

5 A. Yes. So Slide 43 -- the effect of running the code on
6 Slide 43 is actually the same as the effect of running the code
7 on slide -- was it 41?

8 And this is what I would say is the standard
9 recommendation for how to compactly represent data in the Java
10 programming language when you don't have the benefit of, say,
11 an extra -- you know, what -- the extra stuff that dx does.

12 Q. So this is something you could have used in place of the
13 fill array data instruction that's created by the dx tool,
14 right?

15 A. That's right. And you can still use it today.

16 Q. Thank you very much, Mr. Bornstein. I have no further
17 questions.

18 THE COURT: Any more questions?

19 CROSS EXAMINATION

20 BY MR. JACOBS:

21 Q. Do you have Exhibit 735 there, Mr. Bornstein?

22 A. 735?

23 Q. Yes.

24 (Brief pause.)

25 A. No, I don't think I do.

1 Q. That's good, because I have it here.

2 MR. JACOBS: May I, your Honor?

3 THE COURT: You may.

4 (Whereupon, document was tendered
5 to the witness.)

6 BY MR. JACOBS:

7 Q. This, again, is the document you created to specify the
8 bytecode format for the Dalvik VM; correct, sir?

9 A. Yeah, that's what this looks like.

10 Q. Turn to Page 6, please.

11 A. Okay, Page 6. Okay.

12 Q. Halfway down there is an IGET instruction. Do you see
13 that?

14 A. Yes.

15 Q. And it's an IGET instruction that gets the value of a
16 field and stores it in a register, and stores it in register
17 vA; true, sir?

18 A. It's been awhile since I looked at this. Hold on just a
19 second.

20 (Brief pause.)

21 A. Okay. Sorry. What was the question?

22 Q. The IGET instruction gets the value of a field and stores
23 it in the register vA, true?

24 A. Yes, of an instance field, yes.

25 Q. VA is not the numeric memory location of the value of the

1 field; true, sir?

2 **A.** VA is the -- I think in this case is the destination
3 register.

4 **Q.** It's not the numeric memory location of the value of the
5 field; true, sir?

6 **A.** That's right.

7 **Q.** And vB is not the numeric memory location of the value of
8 the field; true, sir?

9 **A.** That's right.

10 **Q.** Field@CCCC is not the numeric memory location of the value
11 of the field; true, sir?

12 **A.** The numeric -- well, it's the numeric index. So that's
13 the location of the field reference.

14 **Q.** The field@CCCC is not the numeric memory location of the
15 value of the field; true, sir?

16 **A.** That's right.

17 **MR. JACOBS:** No further questions, your Honor.

18 **THE COURT:** All right. May the witness step down?

19 **MR. PAIGE:** Yes, your Honor.

20 **THE COURT:** Thank you, Mr. Bornstein. I think you're
21 free to go for good, right? Can we let the witness go for
22 good?

23 **MR. JACOBS:** Subject to recall on Phase 3, your
24 Honor.

25 **THE COURT:** We can't let you go for good, but I can

1 tell you enjoy coming.

2 (Laughter.)

3 **THE COURT:** So you have a good day. Thank you, sir.

4 **THE WITNESS:** Thank you.

5 (Witness excused.)

6 **THE COURT:** All right. The defense may call the next
7 witness.

8 **MR. PAIGE:** Your Honor, defense calls Andy McFadden
9 to the stand.

10 **THE COURT:** Say that name again.

11 **MR. PAIGE:** Andy McFadden, your Honor.

12 **MR. VAN NEST:** I think it will be just a moment.

13 **THE COURT:** Didn't he already testify?

14 **MR. VAN NEST:** Well, he -- yes, he testified in the
15 Oracle case. Now he's going to testify in the Google case.

16 **THE COURT:** All right. Did we keep Mr. McFadden on
17 recall?

18 **MR. VAN NEST:** I don't --

19 **THE COURT:** We'll swear you in again then. Please
20 raise your right hand.

21 **ANDY MCFADDEN,**
22 called as a witness for the Defendant herein, having been first
23 duly sworn, was examined and testified as follows:

24 **THE WITNESS:** I do.

25 **THE COURT:** Welcome again. How are you?

1 **THE WITNESS:** I am well.

2 **THE COURT:** Please remember to speak into the mic.

3 And, here, let me get rid of that other glass for you.

4 **THE WITNESS:** Thank you.

5 **THE COURT:** So go right ahead, counsel.

6 **MR. KAMBER:** Thank you, your Honor.

7 **DIRECT EXAMINATION**

8 **BY MR. KAMBER:**

9 **Q.** Good afternoon, Mr. McFadden. Welcome back.

10 **A.** Good afternoon.

11 **Q.** Would you please state your name for the record again?

12 **A.** My name is Andy McFadden.

13 **Q.** And you didn't get a chance yesterday during your
14 testimony to introduce yourself to the jury.

15 Who are you and where are you from? Where did you go
16 to school?

17 **A.** Well, I grew up in Sunnyvale and I actually still live
18 there. I went to school at the University of California at
19 Berkeley where I have a Bachelor's Degree in electrical
20 engineering/computer science.

21 **Q.** Do you have any hobbies, Mr. McFadden?

22 **A.** Yes. In my spare time I do some martial arts.

23 **Q.** I just wanted Mr. Jacobs to be aware of that in case
24 things get a little heated.

25 (Laughter.)

1 **MR. JACOBS:** I'm wondering how he was going to tie it
2 up, your Honor.

3 (Laughter.)

4 **THE COURT:** All right. That was a good question.
5 I'm giving you a gold star for that question.

6 **BY MR. KAMBER:**

7 **Q.** You work for Google, correct?

8 **A.** Yes.

9 **Q.** What did you do prior to joining Google?

10 **A.** Well, immediately before that I was self-employed for
11 about three years. Before that I worked for a company called
12 Moxi, which built some --

13 (Court reporter interruption.)

14 **A.** And before that I worked at Microsoft WebTV.

15 **Q.** And when did you start working for Google?

16 **A.** It was July of 2005.

17 **Q.** What did you do for Google?

18 **A.** I was a software engineer.

19 **Q.** Are you associated with any particular projects or teams
20 at Google?

21 **A.** Yes, I'm part of Android.

22 **Q.** What type of work have you done on Android while you have
23 been at Google?

24 **A.** Well, I have developed various part of the Android system.

25 A significant amount of my time was spent on the Dalvik Virtual

1 Machine.

2 Q. So let's talk about the Dalvik Virtual Machine. Is the
3 Dalvik Virtual Machine a Java Virtual Machine?

4 A. No.

5 Q. Why not?

6 A. It does not execute Java bytecode.

7 Q. Did the Android team consider using a Java Virtual Machine
8 for Android?

9 A. We did.

10 Q. And did you decide to use one?

11 A. We chose not to.

12 Q. Why not?

13 A. Well, we had to make a decision between building something
14 new or buying something that previously existed. And we spent
15 a lot of time trying to find something to buy, because it's
16 easier to buy something than it is to build something
17 completely from scratch, but we weren't able to -- we did not
18 succeed in our attempts to buy something and so we ended up
19 building it.

20 Q. Did the fact that you were building for a mobile platform
21 impact the design of the Dalvik Virtual Machine in any way?

22 A. Yes.

23 Q. How?

24 A. Mobile devices are a lot less capable than desktop
25 computers. They have less storage available to them. They are

1 slower. They are running off of a battery rather than plugged
2 into the wall. So everything needs to be more efficient and
3 more exact.

4 Q. Did it impact the design of Dalvik bytecodes?

5 A. Yes.

6 Q. How?

7 A. Well, we needed -- we needed them to be, simply put,
8 smaller and faster. And buy using bytecode rather than native
9 code, it's smaller. And then some specific choices we made
10 while designing the Dalvik bytecode format allowed it to be
11 faster than some other options.

12 Q. Are you familiar with dex files, .dex files, Mr. McFadden?

13 A. Yes.

14 MR. KAMBER: If we could please call up for the jury
15 TX 737? It's already in evidence.

16 (Document displayed)

17 BY MR. KAMBER:

18 Q. Do you see this document?

19 MR. KAMBER: May I approach, your Honor?

20 THE COURT: Yes.

21 (Whereupon, document was tendered
22 to the witness.)

23 BY MR. KAMBER:

24 Q. It may make it easier to look at the actual document.

25 A. I think this might be the wrong one.

1 Q. Yeah. I just realized that as well. Thank you, Mr.
2 McFadden.

3 Let me hand you another document, 736. If you would
4 look at that as well, please.

5 (Whereupon, document was tendered
6 to the witness.)

7 Q. What is this document?

8 A. This document describes the format of dex files.

9 Q. If you turn your attention to -- it says here at the very
10 top, correct, it says:

11 "This document describes the layout and
12 contents of .dex files."

13 Right?

14 A. Yes.

15 Q. (As read)

16 "...which are used to hold a set of class
17 definitions and their associated adjunct
18 data."

19 Correct?

20 A. Yes.

21 Q. What does that mean?

22 A. It means that the file holds the instructions and data for
23 a collection of classes.

24 Q. Is this document about the Dalvik executable format? Does
25 this tell you anything about the overall layout of a dex file?

1 A. Yes.

2 Q. Where is that?

3 A. That starts on the second page, where it says "Overall
4 File Layout."

5 Q. We talked yesterday a little bit about where the
6 instructions and where symbolic references are. Where are the
7 instructions in a dex file?

8 A. Well, let me find it. So you have to go into the methods.
9 Okay. Page 17.

10 MR. KAMBER: If we could pull that up on the screen?
11 Page 17.

12 (Document displayed)

13 BY MR. KAMBER:

14 Q. There is something here that says "insns," correct?

15 A. Yes.

16 Q. Is that where the instructions are in a dex file?

17 A. Yes.

18 Q. How do you know that?

19 A. Well, it -- if you look over on the right, it says:

20 "This is the actual array of bytecode."

21 Q. And it goes on to say:

22 "...the format of code in an insns array is
23 specified by the companion document 'Bytecode
24 For the Dalvik VM.'"

25 Do you see that?

1 A. Yes.

2 Q. Are you familiar with that document?

3 A. I am.

4 Q. Do you have that document in front of you as well? I
5 believe it's TX 735.

6 (Document displayed)

7 MR. KAMBER: This is also in evidence, your Honor.

8 A. I have it.

9 BY MR. KAMBER:

10 Q. What is this document?

11 A. This document describes the Dalvik bytecode.

12 Q. If we could turn to Page 6 for a particular example of a
13 bytecode that we'll be talking about today.

14 (Document displayed)

15 A. Okay.

16 Q. In the middle of the page there is something that start on
17 the left-hand side, 52. Do you see that Mr. McFadden?

18 A. I see it.

19 Q. Can you explain for the jury what they are seeing on the
20 monitors in front of them?

21 A. Okay. So what this -- this document is describing is what
22 each of the Dalvik bytecode instructions does, and they are
23 numbered in order.

24 So here we're on instructions 52 through 5f. This
25 particular subsection relates to instance field operations.

1 Q. What is an instance field operation?

2 A. That refers to getting or setting a value in an object.

3 Q. Okay. And there are some instructions here. There are
4 some numbers down the side: 52, 53, 54. Do you see that?

5 A. Yes.

6 Q. And they all say IGET. What does IGET stand for here?

7 A. It is short for instance field get.

8 Q. And then from 59 through 5f, there are IPUT instructions.
9 Do you see that?

10 A. Yes.

11 Q. What is an IPUT instruction?

12 A. It means instance field put.

13 Q. Now, below the yellow highlighting at the top there where
14 it says iinstance, there is a reference to field@CCCC; do you
15 see that?

16 A. I do.

17 Q. The jury has heard a little bit about this already, but
18 what is that, Mr. McFadden?

19 A. Well, that is telling you that the instruction includes an
20 index that tells you the location of an entry in the Fields
21 table.

22 Q. Is that index contained in the Dalvik bytecode instruction
23 stream?

24 A. Yes.

25 MR. KAMBER: Can we have 46.106 up on the screen,

1 please?

2 (Document displayed)

3 **MR. KAMBER:** May I approach, your Honor?

4 **THE COURT:** Yes.

5 (Whereupon, document was tendered
6 to the witness.)

7 **MR. KAMBER:** I believe this is also in evidence, your
8 Honor.

9 **MR. VAN NEST:** What's the number?

10 **MR. KAMBER:** 46.106.

11 **BY MR. KAMBER:**

12 **Q.** What is this file, Mr. McFadden?

13 **A.** This file is called instrUtils.h. It is a .c header file.

14 **Q.** What does a .c header file do?

15 **A.** It defines the API for some instruction utility functions.

16 **Q.** Now, did you write this file?

17 **A.** Yes.

18 **Q.** What's the purpose of this document --

19 **MR. VAN NEST:** We should move it in. I don't show it
20 in.

21 **MR. JACOBS:** It's not in evidence.

22 **MR. KAMBER:** I apologize, your Honor. I thought it
23 was.

24 **THE COURT:** The exhibit number is what?

25 **MR. KAMBER:** It's TX 46.106.

1 **THE COURT:** 46.106 received in evidence. Thank you.

2 **MR. KAMBER:** Thank you.

3 (Trial Exhibit 46.106 received
4 in evidence)

5 **A.** Could you repeat the question?

6 **BY MR. KAMBER:**

7 **Q.** Sure. Well, first of all, you wrote this file, correct?

8 **A.** I did.

9 **Q.** And what is the purpose of this file in the -- is this in
10 the source code?

11 **A.** Yes.

12 **Q.** What is the purpose of this file in the source code for
13 Android?

14 **A.** The defines the API for some instruction utility
15 functions.

16 **Q.** And take a look down further. I believe it's line --
17 well, first of all, let's stop at Line 18. So this talks
18 about -- you just mentioned Dalvik instruction utility
19 functions, correct?

20 **A.** Yes.

21 **Q.** And then at Line 27 it says "Dalvik-defined instruction
22 formats;" do you see that?

23 **A.** I do.

24 **Q.** What is that referring to?

25 **A.** Well, every Dalvik bytecode instruction has a very

1 specific format for how it appears in memory. So this is a
2 listing of all of the different formats that are used.

3 Q. And for the -- let's take a look at Line 57, please.

4 A. Okay.

5 Q. Is this a format for an instruction like that IGET or IPUT
6 that we were just looking at --

7 A. Yes.

8 Q. (Continuing) -- in TX 735?

9 A. Yes.

10 Q. And explain again what is this thing@CCCC referring to
11 here?

12 A. So this format has three parts: VA, vB, thing@CCCC. The
13 last part is indicating that the instruction includes an index
14 to something.

15 This particular format can be used for classes or for
16 fields. So in one case it would be an index into the Field
17 table, and in the other case it would be an index into a Types
18 table.

19 Q. When you say an index into it, it tells you to go to a
20 particular entry in that type of table; is that correct?

21 A. Yes.

22 Q. You also have a document on the stand with you, TX 737.

23 MR. KAMBER: That, I believe, is in evidence, your
24 Honor.

25 (Document displayed)

1 BY MR. KAMBER:

2 Q. What is this document, Mr. McFadden?

3 A. This is the Dalvik instruction formats document.

4 MR. KAMBER: Can we pull up 737, please?

5 (Document displayed)

6 MR. KAMBER: Thank you.

7 BY MR. KAMBER:

8 Q. Now, at the top there is an "Introduction and Overview."

9 It says:

10 "This document lists the instruction formats
11 used by Dalvik bytecode and is meant to be
12 used in conjunction with the bytecode
13 reference document."

14 Do you see that?

15 A. I do.

16 Q. That's the document we were just looking at, the bytecode
17 reference document?

18 A. Correct.

19 Q. On the second page there is a reference to syntax.
20 Mr. Jacobs asked you a few questions about this yesterday.

21 The second sentence says:

22 "Each instruction starts with the named
23 OpCode and is optionally followed by one or
24 more arguments themselves separated by
25 commas."

1 Can you please explain to the jury what that
2 means?

3 **A.** Okay. Each instruction has several parts. The first part
4 is always the OpCode, and that is what it -- it tells the
5 computer what to do. The OpCode might be "add two numbers."

6 The remaining parts are referred to as "arguments" or
7 "operands." And those are the -- the things that you are
8 working on.

9 So, for example, for adding two numbers together the
10 OpCode would be "add," and then there would be two operands,
11 the two things that you were adding together.

12 **Q.** There is a paragraph, a few paragraphs down starts:

13 "Arguments which indicate a literal constant
14 pool index."
15

16 **MR. KAMBER:** It's a little further down. Two down
17 from there. No, one more.

18 (Document highlighted)

19 **BY MR. KAMBER:**

20 **Q.** (As read)

21 "Arguments which indicate a literal constant
22 pool index have the form 'kind@x.'"

23 Do you see that?

24 **A.** I do.

25 **Q.** What is "kind@x" referring to?

1 A. Well, there are four different constant pools and so in
2 each case you need to identify which pool it is, which is what
3 the "kind" part is. And then you need to identify the location
4 within that pool where your information is, which is what the
5 "x" is for.

6 Q. So what are the four different pools that you're referring
7 to, Mr. McFadden?

8 A. They are strings, types, fields and methods.

9 Q. And those are highlighted here on the screen right now.

10 The four kinds of constant pool are: String, type,
11 field and meth; is that correct?

12 A. Yes.

13 Q. And "meth" stands for method?

14 A. Yes.

15 Q. And then it refers to string pool index, type pool index,
16 field pool index, and method pool index. What is that
17 referring to?

18 A. That is referring to what the "x" means. So an index into
19 the table of strings is a string pool index.

20 Q. Let's take a look at the third page of this document. I
21 think it's the next page.

22 (Document displayed)

23 Q. Again, we see an example of instructions. These are the
24 formats again of the instructions; correct, Mr. McFadden?

25 A. Yes.

1 Q. And at the bottom there there is a section. It says "b/a"
2 then "op CCCC." Do you see that?

3 A. I do.

4 Q. And on the right it says "instance-of." Do you see that?

5 A. Yes.

6 Q. What is "instance-of" referring to there?

7 A. "Instance-of" is a Dalvik bytecode instruction.

8 Q. And there is an instruction No. 22c there, do you see
9 that?

10 A. Well, that's format 22c.

11 Q. Format 22c, thank you.

12 And what do we see in format 22c?

13 A. Well, we see that 22c can be used for two different types
14 of instruction. They both take three arguments or three
15 operands; vA, vB, and then some of them will take a type index,
16 some of them will take a field index.

17 Q. Again, an index is a location in a table in memory,
18 correct?

19 A. Yes.

20 Q. There has been some discussion about Resolve.c. I want to
21 change gears a little bit. Are you familiar with Resolve.c?

22 A. I am.

23 Q. Were you involved in writing the code for Resolve.c?

24 A. Yes.

25 Q. Approximately when did that work begin at Google?

1 A. Sometime middle of 2006 on.

2 Q. I'm going to hand you some sections of code. Trial
3 Exhibit 46.3, 46.6, 46.9 and 46.12.

4 MR. KAMBER: May I approach, your Honor?

5 THE COURT: Yes.

6 (Whereupon, documents were tendered
7 to the witness.)

8 BY MR. KAMBER:

9 Q. Are you familiar with the code for Resolve.c?

10 A. I am.

11 Q. If you could just take a quick scan through those four
12 exhibits, please, and tell the jury if you wrote the code or
13 most of the code in those files?

14 (Brief pause.)

15 A. Yes.

16 Q. Generally speaking, what does Resolve.c do?

17 A. Its job is to resolve symbolic references.

18 Q. Does it work on different kinds of data?

19 A. Yes.

20 Q. Different types of references?

21 A. References to different things.

22 Q. What types of things -- what types of references to things
23 does Resolve.c work on?

24 A. Strings, fields, types and methods.

25 MR. KAMBER: Then if we could have Slide 1 of the

1 presentation, please.

2 (Document displayed)

3 **MR. KAMBER:** Thank you.

4 **BY MR. KAMBER:**

5 **Q.** So you mentioned fields, strings, I believe methods and
6 classes; is that correct?

7 **A.** I said "types," but "class" and "type" tend to get used
8 interchangeably.

9 **Q.** There is a list of functions here on the left-hand side.
10 What are these functions that the jury on their screen?

11 **A.** So these are functions in Resolve.c that carry out the
12 actual symbolic resolution.

13 **Q.** And just as an example, it mentions dvmResolveClass and
14 then has some parenthesis there. Do you see that?

15 **A.** Yes.

16 **Q.** What is "dvm" referring to there?

17 **A.** Dalvik Virtual Machine.

18 **Q.** This is a name of a function that's designed to resolve
19 classes in the Dalvik Virtual Machine, correct?

20 **A.** Yes.

21 **Q.** Is that why it has that name?

22 **A.** Yes.

23 **Q.** And the other functions have similar names that reflect
24 the functionality that they perform, is that correct?

25 **A.** Yes.

1 Q. Now, have you provided or have you helped create a
2 demonstrative to show and walk through the code for one of
3 these functions?

4 A. Yes.

5 Q. Which one?

6 A. DvmResolveInstField.

7 Q. What does dvmResolveInstField refer to? What is that
8 resolving?

9 A. That is resolving a reference to an instance field.

10 Q. Let's start again by taking a look. Again, we talked
11 about a dex file and instructions being contained in a dex
12 file.

13 I just have this here so the jury understands. What
14 are we seeing here, Mr. McFadden?

15 A. Well, this is a simplified depiction of a dex file. It is
16 showing instructions and data stored in different portions of
17 the file.

18 Q. And you saw that before where that "insns," correct?

19 A. Yes.

20 Q. Those are the instructions in the dex file?

21 A. Yes.

22 Q. So what do we see on the left-hand side here under the
23 column "Instructions"?

24 A. So this is a somewhat simplified example of a Dalvik
25 bytecode instruction stream. The dashed lines are separating

1 individual instructions.

2 So, for example, at the top it begins with 52, which
3 is the first OpCode. 01, is the first operand for that
4 instruction.

5 Then we start a new instruction which has OpCode 54.
6 It has three operands, 4, 27, 38 and so on.

7 Q. Thank you.

8 So we just talked about the instruction 52. That's
9 an OpCode.

10 (Document displayed)

11 Q. Let's take a look at some of the code here. This is from
12 Trial Exhibit 46.12.

13 What is the jury seeing here?

14 A. This is the start of the implementation of the IGET
15 instruction, and this is arm assembly language code.

16 Q. So you mentioned something IGET. That's at the top there
17 on Line 2475, correct -- or 2474 and 2475, correct?

18 A. Yes.

19 Q. And there is that 52 on the right-hand side. Is that
20 meant to reflect the fact that we're talking about OpCode 52?

21 A. Yes.

22 Q. Now, there is a line here, 2481. Looks similar to some of
23 the exhibits we were just looking at, Mr. McFadden. It says
24 "op vA vB, field@CCCC." What is that referring to here.

25 A. Well, I put this in just so as I'm working on the code, I

1 can remember what the instruction format is supposed to be.

2 So what this is telling me is the order of the
3 operands and it also tells me how -- how large each of them
4 are. So I know how to extract them from the instruction
5 stream.

6 Field@CCCC, once again, is referring to the fields
7 index that is stored in the bytecode.

8 Q. That's what we were just talking about, field@CCCC?

9 A. Yes.

10 Q. Now, there is a FETCH instruction here at Line 2484. Do
11 you see that?

12 A. I do.

13 Q. What is this FETCH instruction doing?

14 A. This instruction is actually -- this is kind of where the
15 rubber meets the road, I guess you could say. This is where we
16 are actually pulling out that CCCC from the instruction stream.

17 Q. What are you doing with it?

18 A. We're going to load it into a machine register called r1.

19 Q. Where do things go from there?

20 A. The next thing that we do is we -- we take that index. We
21 take a pointer to this table that we have of previously
22 resolved fields and we're going to look up an entry.

23 So we take that field index and that takes us to the
24 location of the entry in the Field table, and we're going to
25 check to see if we already have something there.

1 Q. I believe that's illustrated on this next slide.

2 (Document displayed)

3 Q. Can you just walk the jury through what's happening here?

4 A. So 01 is the operand which has the field index in it.

5 The table over in the green section that says

6 "Resolved Fields Table" is what we are indexing into.

7 Q. When you say you index into it, what do you mean?

8 A. The index gives us the location in the table where we want
9 to look for the data, and in this case the table is empty. So
10 we're not actually finding anything.

11 Q. Let's go back to the code for a minute.

12 (Document displayed)

13 Q. Line 2488 has some comments, "is resolved entry null." Do
14 you see that?

15 A. Yes.

16 Q. What happens if it is null and there is nothing in that
17 Resolved Fields Table in this particular instance?

18 A. If the entry is null, we're going to continue executing
19 the code that is beneath the compare instruction, and we're
20 going to --

21 Q. Sorry. That's this -- I don't mean to interrupt you, but
22 you're pointing to the code at 2493, is that correct?

23 A. Yes. So we hit 2489, '90, '91, '92 -- I'll slow down.

24 Sorry. '93. And at 2493 we are going to call a function
25 called dvmResolveInstField.

1 Q. That's a function in Resolve.c, correct?

2 A. Yes.

3 (Document displayed)

4 Q. So as we have illustrated here with these slides, we have
5 just cut over to a different file. This is dvm -- excuse me,
6 Dalvik/vm/oo/resolve.c, correct?

7 A. Yes.

8 Q. This is Trial Exhibit 46.6.

9 And what does the jury see here on Line 383?

10 A. So this is the start of the dvmResolveInstField function.
11 Its second argument is something called ifieldIdx. That is the
12 field index that we got from the instruction stream. So that
13 field@CCCC thing is just getting passed along into this
14 function.

15 Q. In the example that you had, it's the 01 that was in that
16 instruction stream, is that correct?

17 A. Yes.

18 Q. What do you do with that 01, with that piece of
19 information in this dvmResolveInstField function?

20 A. So the next thing we're going to do is get the location of
21 the -- well, it's an entry in the Field ID table. So we're
22 going to call this dexGetFieldId function, passing the fieldIdx
23 into it.

24 Q. And you see that on this next slide, correct, Mr.

25 McFadden?

1 (Document displayed)

2 A. Yes.

3 Q. 01 goes to this Field ID table, correct?

4 A. Yes.

5 Q. And what is that 01 in the Field ID table?

6 A. Oh, that is -- that is -- entry 01 is the fieldId entry
7 for the field that we're interested in. The entries in the
8 Field ID table have two elements. The first is a Name Index.
9 The second is a Type Index. And so here the Name Index is 2.
10 The Type Index is 76.

11 Q. So we started with an index in the instruction, that's 01;
12 correct?

13 A. Yes.

14 Q. We've traced that through and now we've found two more
15 indexes, is that correct?

16 A. Yes.

17 Q. Now what do we do with those indexes?

18 A. Well, we are going to call another function using those
19 indexes. So the highlighted line is calling dexStringById, and
20 it is going to pass the Name Index into that function.

21 Q. And the Name Index that you just referred to, that's
22 nameIdx in the code?

23 A. Yes.

24 Q. So let's illustrate that here on the screen.

25 (Document displayed)

1 Q. You follow the -- 02 points to the entry 2 -- or the entry
2 labeled 02 in the String ID table, is that correct?

3 A. Yes.

4 Q. And what is the String ID table?

5 A. The String ID table holds offsets to raw string data. So
6 you can use them to get the location of essentially the human
7 readable symbol for the field that we're trying to get to.

8 Q. Can you explain? We have just been talking about indexes
9 and now you just used the term "offset." What's the
10 distinction between an "index" and an "offset"?

11 A. Very little. Within a dex file we usually use index to
12 refer to an entry in a table; whereas, an offset is usually
13 from the very start of the dex file. Trying to find some
14 arbitrary piece of data.

15 But it's -- they are both numbers. They are both --
16 you know, you start from someplace. You index or offset your
17 way down and you've got a location.

18 Q. Are they both referring to locations in memory?

19 A. Yes.

20 Q. And in this case this offset 08 points to the StringData,
21 is that correct?

22 A. Yes.

23 Q. And what does it find there?

24 A. Well, it's going to find the word "fun."

25 Q. I'm sure the jury is having a lot of fun so far walking

1 through the code.

2 So let's do that again. There is that number 76 on
3 the left-hand side. That was also in the Field ID table,
4 correct?

5 **A.** Yes.

6 **Q.** So we've highlighted here some code at the bottom of
7 Slide 20. This is Line 406 in Trial Exhibit 46.6.

8 (Document displayed)

9 **Q.** What is happening here?

10 **A.** Here we are taking the Type Index that we got from the
11 Field ID table and we are passing it into dexStringByTypeIdx to
12 get the symbol for the field's type.

13 **Q.** Let's trace that through the table, we go to entry 76 in
14 the string ID table?

15 **A.** Yes.

16 **Q.** And what do we find at entry 76 in the String ID table?

17 **A.** Offset 104 into the String Data table.

18 **Q.** So we trace that along, and what do we find there?

19 **A.** We find the String Byte.

20 **Q.** Now, we have arrived at "fun." We have arrived at "byte."
21 What are those?

22 **A.** These are different from anything that we have encountered
23 so far because up until now everything we have pulled out of
24 the tables has been numeric. You start with 1. You get to 2
25 in 76. Each of those tells you exactly where to go next.

1 We're really just playing a game of connect-the-dots
2 point. But with "fun" and "byte" there is no dot. These are
3 symbols not numbers, and so we have to treat them differently.

4 Q. How do you treat them differently in the computer system?

5 A. Well, in this case we're going to do what's called dynamic
6 resolution.

7 Q. So let's look at this process, dynamic resolution. We
8 have "fun." We have "byte." We take that information and now
9 we have to go to -- this is Trial Exhibit 46.9. It's a file
10 entitled "Object.c," correct?

11 A. Yes.

12 Q. Does this file do the resolution process?

13 A. Yes.

14 Q. And looking at Line 36 this says:

15 "Find a field with a matching name and
16 signature."

17 Correct?

18 A. Yes.

19 Q. What is that taking about?

20 A. Well, the name and signature in this case are the "fun"
21 and "byte" that we have -- we have just found. So there is a
22 table of fields and we want to find the one that matches on
23 both the name and the type.

24 Q. How does it --

25 **THE COURT:** May I ask a question?

1 I thought you said earlier that the word "fun" was
2 the final thing that we were looking for, but now it sounds
3 like it's some sort of intermediate step to get to the funding
4 we're looking for. So I don't quite get it.

5 **THE WITNESS:** Well, there are a series of steps, and
6 it is a step along the way.

7 **THE COURT:** But is that word "fun" -- like somebody
8 typed in the word "fun" and it's stored in the computer
9 somewhere, or does that just happen to be, you know, like ABC,
10 some symbol for a variable?

11 Is it meant to be the word, like in a string, or is
12 it like XYZ equals 1?

13 **THE WITNESS:** It is an actual string. So in the dex
14 file, it will have the characters F-U-N.

15 **THE COURT:** And is that the end thing that we're
16 looking for?

17 **THE WITNESS:** No.

18 **THE COURT:** So what are we looking for? Tell us
19 where we're going to wind up on this long tortuous road.

20 (Laughter.)

21 **MR. VAN NEST:** Lunch your Honor.

22 **THE COURT:** In 15 minutes maybe. Not yet.

23 (Laughter.)

24 **THE COURT:** Where are we going to wind up?

25 **THE WITNESS:** So what we're trying to illustrate with

1 this is the process of field resolution. What we have right
2 here is the symbolic resolution code. So once this completes,
3 we're pretty much home.

4 **THE COURT:** Well, all right. Why don't you -- I
5 still don't understand, but we're going to get there. We'll
6 try to get there before lunch, so --

7 **MR. KAMBER:** You're jumping ahead in the story, your
8 Honor.

9 **THE COURT:** We're all waiting to see where these come
10 out.

11 **BY MR. KAMBER:**

12 **Q.** The judge asked a good question, Mr. McFadden. Is
13 something like "fun" or "byte," is that considered a variable
14 or a name in the system?

15 **A.** It is a string constant.

16 **Q.** And are string constants used by programmers to be
17 variables in programs?

18 **A.** They can be.

19 **THE COURT:** Like Hello World, that could be a string
20 constant, right?

21 **THE WITNESS:** Yes, your Honor.

22 **THE COURT:** Well, "byte" now, "byte" is not the same
23 thing as a string constant.

24 **THE WITNESS:** As -- in this context it is literally
25 b-y-t-e.

1 **THE COURT:** Not 1, 2, 3 or 4? It's b-y-t-e.

2 **THE WITNESS:** B-y-t-e.

3 **THE COURT:** As opposed to what else could it be in
4 that box?

5 **MR. KAMBER:** Back up to the string data here so
6 everyone has this in front of them.

7 (Document displayed)

8 **THE COURT:** It could be a character. It could be a
9 byte. What are the alternatives?

10 **THE WITNESS:** Well, this is the name of the class
11 that the -- it's the -- the name of the type that the field
12 holds. So if the field holds a single byte, you would say
13 byte. If the field holds an object that represents a triangle,
14 then you would have the string triangle.

15 So it can hold anything. There is really no limit on
16 it other than what the Java language defines as far as what the
17 legal set of characteristics are.

18 **THE COURT:** All right. So let's push ahead.

19 **BY MR. KAMBER:**

20 **Q.** One quick question: Does it have to be a letter?

21 **A.** I'm trying to remember what the Java language spec says.
22 You can definitely have things that aren't letters. You can
23 have numbers. You can have underscores, dollar signs.

24 It may have to start with a letter. I can't remember
25 at this moment.

1 Q. Okay. So let's jump -- we were just talking about 46.9.

2 Now there's some code that's boxed in here. And this takes in
3 the "fun" and the "byte" that we were just looking at, correct,
4 this code --

5 A. Yes.

6 Q. (Continuing) -- uses that?

7 Is it using that for the resolution process?

8 A. Yes.

9 Q. So let's see how that goes.

10 (Document displayed)

11 Q. So what's happening here on the demonstrative, Mr.
12 McFadden?

13 A. So what we're going to do is we're going to search through
14 a table. And this is simplified somewhat, but the idea is that
15 a class has a list of fields and we are trying to find the
16 field whose name and type match what we pulled out previously.

17 Q. It searches through this table, correct?

18 A. Yes. And so this is just illustrating here that the name
19 matched, but the type didn't, and so we move on to the next
20 one.

21 Q. What happens once you find a match?

22 A. When we find a match, then we look over one column and we
23 can find a pointer to a block of field information.

24 Q. Okay. So we started with the number of indexes, correct?

25 A. Yes.

1 Q. Then we hit some symbols in the string data, correct?

2 A. Yes.

3 Q. And now we've resolved those symbols to a pointer,
4 correct?

5 A. Yes.

6 Q. What do you do with that pointer?

7 A. Well, we're going to take the pointer and we're going to
8 store it in the Resolved Fields table.

9 Q. What happens after you -- well, let's take a look at the
10 code.

11 (Document displayed)

12 Q. Is this the code that represents the storage of the
13 pointer in the Resolved Fields table?

14 A. Yes.

15 Q. This is Line 425 of Trial Exhibit 46.6.

16 (Document displayed)

17 Q. What happens next?

18 A. Well, at this point the IGET instruction is free to
19 continue on its way and get the actual field data out of an
20 object.

21 Q. And this is -- this 21 is a pointer to the field?

22 A. The 21 is pointing to this field scriptor, which has a
23 number of fields describing its class, its name, its type. And
24 then the last one is an offset, and that tells you the location
25 within an object where the actual data may be found.

1 Q. Okay. So once you reach the field, you're not at the
2 ultimate location, but the offset tells you the ultimate
3 location; is that correct?

4 A. Yes.

5 THE COURT: Is the word "class" there? Can you go
6 back?

7 Is that used in the same way as "Package," "Class,"
8 "Method" for Java language purposes or has that got a different
9 meaning?

10 THE WITNESS: No, same meaning.

11 THE COURT: All right. Continue.

12 BY MR. KAMBER:

13 Q. And this happens for other forms of instructions; correct,
14 Mr. McFadden?

15 A. Yes.

16 Q. As you go through the OpCodes and the operands, is it fair
17 to say that you're resolving symbols to pointers?

18 A. Yes.

19 Q. And with those pointers, you store those pointers in the
20 Resolved Fields table, correct --

21 A. Correct.

22 Q. (Continuing) -- as you're going through?

23 And the next time we hit this 52, this IGET
24 instruction, correct?

25 A. Yes.

1 Q. You'll index into, again, the location labeled 01 in the
2 Resolved Fields table, correct?

3 A. Right.

4 Q. And this time it's not null, correct?

5 A. Yes.

6 Q. It says 21.

7 A. Yes.

8 MR. JACOBS: Your Honor, a lot of leeway, but I think
9 this is leading.

10 THE COURT: Yes. Remember not to lead. Go ahead.

11 MR. KAMBER: Okay, I was just trying to sped things
12 along.

13 BY MR. KAMBER:

14 Q. What happens once you get to 21?

15 A. Well, at this point, since we've already gone through the
16 process once and we remembered the result of what we did last
17 time, we don't have to go through that long journey again. We
18 have a pointer to the field information and we can just use
19 that directly.

20 Q. And so here you -- where does the pointer point to?

21 A. It points to this field block.

22 Q. Now, you've just walked us through the code that resolves
23 a field reference, correct?

24 A. Yes.

25 Q. Is there code in Resolve.c that resolves other types of

1 references?

2 **A.** Yes.

3 **Q.** Okay. Which part of the code in Resolve.c resolves
4 classes?

5 **A.** DvmResolveClass.

6 **Q.** Which part of the code in Resolve.c resolves Methods?

7 **A.** DvmResolveMethod.

8 **Q.** Which part of the code in Resolve.c resolves interface
9 methods?

10 **A.** DvmResolveInterfaceMethod.

11 **Q.** And which part of the code in Resolve.c resolves static
12 fields?

13 **A.** DvmResolveStaticField.

14 **Q.** Do all of those resolution processes work in basically the
15 same way as we just saw walking through the example of
16 resolving a field reference?

17 **A.** At a high level.

18 **Q.** And are indexes in this process being resolved?

19 **A.** No.

20 **Q.** Why do you say no?

21 **A.** Well, resolution implies something is unknown, something
22 is ambiguous. If you have an index, you know exactly where
23 you're going. You have the location.

24 For symbols, you don't know where you're going and
25 you won't know until you have resolved the ambiguity. So it

1 doesn't really make sense to say that you "resolve an index."

2 **Q.** We heard a lot about Resolve.c, probably more than anyone
3 cared to know.

4 We're going to switch gears and talk about something
5 called dexopt.

6 **THE COURT:** How long is this going to take?

7 **MR. KAMBER:** I was going to suggest that we might
8 want to break here.

9 **THE COURT:** Well, I think that's a grand idea.

10 (Laughter.)

11 **THE COURT:** We're going to break here.

12 **MR. VAN NEST:** Second gold star.

13 **THE COURT:** Yes, it is. Thank you.

14 We'll see all back here in 15 minutes -- I mean,
15 tomorrow, 7:45.

16 **THE CLERK:** All rise.

17 (Jury exits courtroom at 12:49 p.m.)

18 **MR. KAMBER:** I feel like I'm getting the hook.

19 **THE COURT:** Be seated.

20 Mr. McFadden, please try to be here at 7:30 in the
21 morning. We'll march right ahead. You can step down though.
22 Thank you.

23 (Witness steps down.)

24 **THE COURT:** Everyone else be seated.

25 Any issues for the Court?

1 **MR. JACOBS:** No, your Honor.

2 **THE COURT:** So we will meet again in 55 minutes or so
3 and -- what time did I say?

4 **MR. VAN NEST:** You said 1:30.

5 **THE COURT:** All right. We'll start at 1:30 and try
6 to go through the -- I've got an afternoon calendar so I've got
7 to do this around the edges, but I'm hoping you don't have that
8 many changes.

9 **MR. VAN NEST:** Your Honor, this is the charging
10 conference you were talking about?

11 **THE COURT:** Yes.

12 **MR. VAN NEST:** That's fine.

13 **THE COURT:** We'll start at 1:30, okay? See you then.
14 (Whereupon there was a recess in the proceedings
15 from 12:50 p.m. until 1:26 p.m.)

16 **THE COURT:** Please be seated. Let's go to work.

17 Okay. Just so you'll know your time, I'm about to
18 give you -- it's kind of like a computer. 401 plus 54 is 455,
19 plus 3 is 458 used by plaintiff, out of 660.

20 For defendant, it looks like 160 plus 16 plus 15 plus
21 48. You'll have to help me with the math.

22 Okay. Now we go to our instructions. So you know
23 the drill by now.

24 On the first part, I reduced it because I had
25 previously given them instructions, right, so I didn't think I

1 needed to repeat some things. But I don't feel very strongly
2 about it. If somebody wants something back in, I'm happy to
3 consider it.

4 So we'll start with number -- let's go through it,
5 first.

6 Number one, any objections?

7 **MR. JACOBS:** No, Your Honor.

8 **MR. KAMBER:** The only thing we would raise is to
9 perhaps suggest in the first line:

10 "Members of the jury it is now my duty to
11 instruct you on the law that applies to this
12 phase of the case."

13 **THE COURT:** All right. That will be good.

14 Okay. 2?

15 **MR. JACOBS:** Nothing, Your Honor.

16 **MR. KAMBER:** Nothing, Your Honor.

17 **THE COURT:** 3?

18 **MR. JACOBS:** Nothing.

19 **MR. KAMBER:** Nothing.

20 **THE COURT:** 4?

21 **MR. JACOBS:** Nothing.

22 **MR. KAMBER:** Nothing.

23 **THE COURT:** 5?

24 **MR. JACOBS:** Nothing.

25 **MR. KAMBER:** Nothing.

1 **THE COURT:** On 5, I need to ask, have any charts and
2 summaries actually been received into evidence?

3 **MR. JACOBS:** I don't believe so.

4 **MR. KAMBER:** Not that I'm aware of.

5 **MR. JACOBS:** No.

6 **THE COURT:** So let's take out that first paragraph.
7 But, certainly, the second paragraph should stay in.

8 Number 6?

9 **MR. JACOBS:** Nothing.

10 **MR. KAMBER:** We have a few suggested edits, Your
11 Honor. They are relatively straightforward. This is a change
12 to the second sentence. Starts "In this case."

13 **THE COURT:** Uh-huh.

14 **MR. KAMBER:** We would suggest it reads:

15 "The preponderance of the evidence standard
16 applies to Oracle, who has the burden of
17 proof on all issues that you must decide."

18 I don't believe there is a burden of proof issue on
19 any of our --

20 **THE COURT:** That's correct; isn't it?

21 **MR. JACOBS:** I think that's true, Your Honor. I
22 think later on you'll deal with who has the burden of proof on
23 what. So this is a general statement of the standard, not who
24 bears what burden.

25 **THE COURT:** Well, that's true. I'll say, "Applies to

1 Oracle, who has the burden of proof on all issues in this
2 phase." Doesn't make sense when I do that. Let's see.

3 "In this case, the preponderance of the
4 evidence standard applies." Period.

5 Don't I say later on who has the burden of proof?

6 **MR. JACOBS:** Yes, Your Honor. That's why I think it
7 should remain --

8 **THE COURT:** I'm going to take out the rest of that
9 sentence, but I'm not going to start getting into Oracle. If I
10 say it later, that will be fine. All right. When a party has
11 the burden of proof, et cetera. Okay. I'll make some of that
12 change.

13 Number 6, anything more?

14 **MR. BABER:** In the second sentence, the first clause
15 of that same sentence, "In this phase" ...

16 **THE COURT:** Yes.

17 **MR. BABER:** Rather than "in this case."

18 **THE COURT:** That's true.

19 **MR. BABER:** Different standards --

20 **THE COURT:** Good.

21 Number 7?

22 **MR. JACOBS:** Nothing, Your Honor.

23 **THE COURT:** 7 in.

24 **MR. KAMBER:** The only issue is whether to put Oracle
25 for plaintiff. But we don't feel strongly about that.

1 **THE COURT:** No.

2 **MR. JACOBS:** I was wondering if you intended bolding
3 the "its."

4 **THE COURT:** No, I didn't. I think I was just trying
5 to emphasize to somebody, at some distant point in the past,
6 that a corporation is an "it." I don't know why it's in there.
7 It's just a mistake. But we will fix it. Okay. Thank you for
8 bringing that up.

9 Number 8?

10 **MR. JACOBS:** Nothing, Your Honor.

11 **MR. KAMBER:** We have a few proposals. Or proposed
12 edits.

13 In the second sentence it refers to "allegedly
14 infringing of the claims." I believe the "of" should be
15 deleted.

16 **THE COURT:** You're right.

17 **MR. KAMBER:** And with respect to the second clause,
18 it says "and claims 1, 8, 12 and 20 of the '520 Patent."

19 **THE COURT:** Uh-huh.

20 **MR. KAMBER:** 8 and 12 are no longer asserted.

21 **MR. JACOBS:** That's correct, Your Honor.

22 **THE COURT:** So it would be 1 and 20. Okay. That's a
23 good point.

24 Are all those other ones asserted for number '104?

25 **MR. KAMBER:** Correct.

1 **THE COURT:** Okay. Great.

2 **MR. KAMBER:** And one last thing, on the bottom line
3 it says:

4 "Google denies that it infringes, and further
5 denies that it is legally responsible for
6 the ..."

7 I would suggest "alleged infringement" by others, or
8 "any infringement by others."

9 **THE COURT:** I'll say "any."

10 **MR. KAMBER:** Thank you, Your Honor.

11 **THE COURT:** Okay. Number 9?

12 **MR. JACOBS:** Nothing, Your Honor.

13 **MR. BABER:** Your Honor, just a question. I don't
14 know if you want to clarify this one. The second sentence
15 talks about the figures and the specification in the patent.
16 And there hasn't been a lot of talk in this phase about the
17 spec of the patent. And we heard a lot about API specs in
18 Phase One. I just didn't know whether you wanted to just
19 explain to them we're talking about a different animal in this
20 phase.

21 **THE COURT:** Well, that's a fair point. Let's see.
22 What else is the specification known as?

23 **MR. BABER:** Say the "text" or the "description."

24 **MR. JACOBS:** They heard "specification," Your Honor,
25 in the patent video.

1 **THE COURT:** Well, that's true. But what else is it
2 called sometimes?

3 **MR. BABER:** "Text of the patent."

4 **MR. JACOBS:** It's a written description that
5 concludes with claims. It really is called the
6 "specification."

7 **MR. BABER:** I wasn't necessarily suggesting take out
8 the word "specification," but just make clear to them you are
9 talking about a different animal from the first phase.

10 **MR. PAIGE:** What you could do, Your Honor, is just
11 say "a specification," which is everything that comes before
12 the claims of the patent. That might clarify it.

13 **THE COURT:** How about this:
14 "The figures and the rest of the patent
15 provide a description and/or example."
16 How's that?

17 **MR. JACOBS:** That's fine, Your Honor.

18 **MR. KAMBER:** That's fine.

19 **MR. BABER:** Perfect.

20 **THE COURT:** Okay. Anything else? Wait. I got the
21 word "specification" -- is often the case that a patent
22 specification -- how about "disclosure"?

23 **MR. BABER:** I would just take it out and say "a
24 patent and its figures."

25 **THE COURT:** All right. "A patent and its figures."

1 All right.

2 **MR. JACOBS:** Your Honor, actually, now I am becoming
3 concerned that they did hear the phrase "specification" in the
4 patent video, and now we're not explaining that term. I think
5 it's also come up --

6 **THE COURT:** I'm going to leave the last two instances
7 of "specification" where they are. I'll take out the first
8 instance.

9 Okay. Let's go to number 10.

10 **MR. JACOBS:** Nothing, Your Honor.

11 **MR. KAMBER:** Here, again, in light of the
12 non-assertion of claims -- I believe it's 8 and 12 -- there
13 need to be some modifications, Your Honor.

14 **THE COURT:** So tell me what to do.

15 **MR. KAMBER:** So let me start with the easy part
16 first. I think we can probably delete the entire second
17 paragraph. And in the sentence --

18 **THE COURT:** Did the first paragraph of 10 stay as is?

19 **MR. KAMBER:** No. The last line I would read as
20 follows:

21 "For the '520 Patent, Claim 1 is an
22 independent claim."

23 New sentence:

24 "Claim 20 is a dependent claim that
25 incorporates independent Claim 18."

1 **THE COURT:** So we take out "Claim 8 incorporates"?

2 **MR. KAMBER:** Yes.

3 **THE COURT:** Is Claim 8 out of the case now?

4 **MR. KAMBER:** Correct.

5 **THE COURT:** So then it would go to: "Claim 20
6 incorporates independent Claim 18"?

7 **MR. PAIGE:** Correct.

8 **THE COURT:** All right.

9 **MR. KAMBER:** And then deleting the sentence that
10 begins "thus," at the end of the paragraph.

11 **MR. JACOBS:** I think that 20 is -- 20 depends from --

12 **MR. PAIGE:** 18.

13 **MR. JACOBS:** -- 18. So how are we going to
14 explain --

15 **THE COURT:** We are still going to say that, though.
16 "Claim 20 incorporates independent Claim 18."

17 **MR. JACOBS:** Yes.

18 **MR. KAMBER:** Right.

19 **THE COURT:** That will still be in.

20 **MR. JACOBS:** Great.

21 **THE COURT:** Then how about the second paragraph?

22 **MR. KAMBER:** You could just change the -- you could
23 change the claims to 18 and 20 here.

24 **MR. JACOBS:** There are no disputed elements in 18.
25 So it may be confusing to have a whole paragraph about 18.

1 **MR. KAMBER:** Frankly, Your Honor, I think --

2 **THE COURT:** Can't we just take it out? Shall we just
3 take out that paragraph?

4 **MR. KAMBER:** I think you could take it out.

5 **THE COURT:** That second paragraph is out. Excellent.
6 What's next? Oh, number 11, paragraph 11.

7 **MR. KAMBER:** Nothing from us, Your Honor.

8 **MR. JACOBS:** There is no disagreement around
9 "intermediate form code" and "intermediate form object code."

10 **THE COURT:** If you both agree, I will take it out.

11 **MR. JACOBS:** They have heard the expression. I just
12 don't want to suggest to them that there's a dispute about that
13 limitation. The only limitation that has a construction issue
14 identified in the Court's construction rulings is "symbolic
15 reference."

16 **THE COURT:** Then I'm just going to leave them as they
17 are. I don't know what else I can --

18 **MR. KAMBER:** There's also -- I believe there's an
19 instruction for the play executing.

20 **MR. JACOBS:** There are no claims left with that
21 phrase in them. It's all simulating.

22 **THE COURT:** All right. Well, I --

23 **MR. PAIGE:** But the words are used in the patent, and
24 the jury should know that's what they mean, if that's what the
25 Court has ruled.

1 **MR. JACOBS:** There's no claim --

2 **THE COURT:** Look. If it's not in one of the claims
3 that's being asserted, either directly or indirectly, there is
4 no logical way it could get into the case. If it is being
5 asserted in a claim indirectly, then, of course, we will
6 instruct them on it.

7 But just because I construed something in the past
8 that is in the patent doesn't mean the jury has to hear about
9 it.

10 **MR. PAIGE:** Understood, Your Honor. But the code
11 table number 5 that we were talking about today used the term
12 "play execution." And the jury should understand you've ruled
13 that means --

14 **THE COURT:** "Play execution," is that the code table
15 in the patent?

16 **MR. PAIGE:** It's code table number 5 in the patent,
17 Your Honor. Dr. Mitchell was examined on it today. The jury
18 should know that Your Honor has ruled that "play execution" is
19 the same thing as "simulated execution."

20 **MR. JACOBS:** I don't think so, Your Honor.

21 There's no claim construction that they need to be
22 advised up. The "play execution" phrase appears in the
23 specification. If they read deeply, they will encounter it.
24 They will see exactly the same definitional language the Court
25 encountered when it so ruled. But I don't think we need to

1 confuse them with an instruction.

2 **THE COURT:** It's not claim construction. It's just
3 trying to help one side with its argument. That's what's going
4 on here. I'm not going to put that in here unless it's in one
5 of the asserted claims.

6 Anything else on 11?

7 **MR. KAMBER:** No, Your Honor.

8 **THE COURT:** Number 12?

9 **MR. JACOBS:** Nothing, Your Honor.

10 **MR. KAMBER:** Nothing, Your Honor.

11 **THE COURT:** 13?

12 **MR. JACOBS:** So "covered" is the word in the first
13 sentence of 13, Your Honor. And it's somewhat ambiguous. We
14 would propose to define "covered" --

15 **THE COURT:** How about "protected"?

16 **MR. JACOBS:** Great.

17 **THE COURT:** "Protected."

18 **MR. KAMBER:** That's fine, Your Honor.

19 **THE COURT:** Okay.

20 **MR. BABER:** What about the second sentence?

21 **MR. JACOBS:** Right. A product or method directly
22 infringes a patent if it -- I would say "if all elements of the
23 claim are present in" -- "of a claim are present in the product
24 or method."

25 **THE COURT:** If all --

1 **MR. JACOBS:** "All elements of a claim" --

2 **THE COURT:** How about "limitations"?

3 **MR. JACOBS:** I think they heard "limitations." So I
4 think that's okay.

5 **MR. KAMBER:** Fine.

6 **THE COURT:** "Limitations of a claim" --

7 **MR. JACOBS:** "... claim of a patent..."

8 **THE COURT:** It's got to be an asserted claim.

9 **MR. JACOBS:** Sure.

10 **THE COURT:** "... an asserted claim are present ..."

11 **MR. JACOBS:** "... present in the product or method."

12 **THE COURT:** "... in the product or method."

13 Okay. Done.

14 14?

15 **MR. JACOBS:** Now, actually, we would propose -- to
16 avoid some possible confusion, we would propose to add:

17 "Oracle only needs to prove that at least one
18 asserted claim of a patent has been infringed
19 in order for there to be patent
20 infringement."

21 **MR. KAMBER:** We would object to that, Your Honor.

22 **THE COURT:** Well, this is on paragraph 13?

23 **MR. JACOBS:** Yes. I'm trying to -- the "at least one
24 claim" language dropped out because we fixed it, and I'd
25 like --

1 **THE COURT:** What we ought to say, maybe a little
2 differently, is to say:

3 "Each claim asserted must be separately
4 analyzed."

5 **MR. BABER:** I think you already have that at the end
6 of 14, Your Honor. On top of page 9. Sentence says:

7 "You must decide infringement for each
8 asserted claim separately."

9 **MR. JACOBS:** This is just trying to avoid some
10 confusion. You infringe a patent if you infringe one claim of
11 a patent.

12 **MR. BABER:** I think the way it's going to the jury
13 though, Your Honor, is they are going to be asked specific
14 questions claim by claim. And they'll just answer the
15 questions. They don't have to decide -- (unintelligible) claim
16 by claim, anyway.

17 **THE COURT:** I'm going to put in each one has to be
18 done independently. It's true it comes up later, but this is a
19 fundamental, logical point that's not going to hurt to repeat
20 it.

21 So, all right. That's 13. Anything more?

22 **MR. JACOBS:** Not -- no, Your Honor.

23 **THE COURT:** How about 14?

24 **MR. JACOBS:** Yes, a few things.

25 We'll give you some grammatical suggestions, but the

1 substantive point here is one we briefed. And it's the
2 question of whether distributing or offering a product without
3 requiring a cash price for it at the moment of the transaction
4 constitutes a use or sale.

5 And Android is available for download from the
6 Android website. We would not want the jury to think that
7 Google has not, within the meaning of the law, sold or offered
8 for sale Android.

9 **THE COURT:** Show me where that could go wrong?

10 **MR. JACOBS:** The proposed language would go in line
11 18. And we would say:

12 "Distributing or offering a product for free
13 constitutes a use or sale."

14 **THE COURT:** What's wrong with that?

15 **MR. PAIGE:** Well, what's wrong with it is some law
16 that we cited in briefing the jury instruction issues last
17 fall, that there are cases that say that distributing something
18 for free does not constitute a sale and, therefore, doesn't
19 constitute an act of infringement.

20 **THE COURT:** What was that language, again,
21 Mr. Jacobs? "Distributing or offering..."

22 **MR. JACOBS:** "... a product for free constitutes a
23 use or sale."

24 **THE COURT:** "Use or sale."

25 That's got to be the law. At least on the facts of

1 this case. It would be wrong for the jury to have the idea
2 that Google, if it is infringing, is excused from infringing
3 merely because of this free thing on the Internet.

4 We all know that Google makes millions off of this,
5 and this is -- indirectly, maybe, but it's the way it works.
6 So this should not be -- this is a no-brainer. The law has to
7 be this.

8 **MR. KAMBER:** Just --

9 **THE COURT:** Your point is preserved for appeal.

10 **MR. KAMBER:** That's my only --

11 **THE COURT:** It's preserved for appeal.

12 All right. Where does this go?

13 **MR. JACOBS:** We'll have to fiddle with the next
14 sentences if it has "it directly infringes," but, otherwise, it
15 could go right at the end of the sentence that ends toward the
16 end of line 18.

17 **THE COURT:** All right. That's where it will go.

18 Okay. What's next?

19 **MR. JACOBS:** So some ands turning to ors and some
20 other grammatical suggestions. On line 20:

21 "You must consider each asserted claim of a
22 patent individually."

23 **THE COURT:** All right.

24 **MR. JACOBS:** (As read:)

25 "To decide whether an accused product or

1 method directly infringes a claim of an
2 asserted patent, you must compare the accused
3 product or method with that particular patent
4 claim and determine whether every requirement
5 of the particular claim is included" --

6 **THE COURT:** Asserted claim. Asserted claim.
7 Asserted claim.

8 **MR. JACOBS:** Sure.

9 **THE COURT:** "... is included ..."

10 **MR. JACOBS:** "... is included in the accused product
11 or method."

12 **THE COURT:** All right. Okay. I'm embarrassed I had
13 all those mistakes in there, but that's why we are here.

14 All right. Those are good changes.

15 **MR. JACOBS:** (As read:)

16 "If so, then the maker, user, or seller of
17 the product or method directly infringes that
18 claim."

19 **THE COURT:** Right.

20 **MR. JACOBS:** (As read:)

21 "If, however, the accused product or method
22 does not meet every requirement in the
23 particular asserted claim, then the maker,
24 user, or seller does not directly infringe
25 that claim."

1 **THE COURT:** All right. What do you have over there?

2 **MR. KAMBER:** Two other issues. One non-substantive,
3 one more substantive.

4 On the last line -- this is the top of page 9, line
5 2, I would suggest:

6 "Must prove infringement of each claim by a
7 preponderance of the evidence."

8 **MR. JACOBS:** Huh-uh. That's not correct, Your Honor.

9 **THE COURT:** Well, that would lead them to believe
10 that if they don't prove every one of them then Oracle loses.

11 **MR. KAMBER:** Fair enough. I withdraw that
12 suggestion.

13 **THE COURT:** This is good enough. This is good right
14 here.

15 **MR. KAMBER:** The substantive point, Your Honor, is,
16 whether it's here or -- which this is a good place for it with
17 the direct infringement charge -- or on the verdict form,
18 there's an issue about the phones, the particular phones that
19 are accused of infringement, and whether those should be
20 listed.

21 We're down to eight phones in this particular case,
22 and only a certain subset of those are accused of direct
23 infringement.

24 **THE COURT:** Well, let's take that up on the Special
25 Verdict Form.

1 **MR. PAIGE:** Thank you, Your Honor.

2 **THE COURT:** All right. Number 15.

3 I'm going to have to break in about 15 minutes.

4 15, any objections?

5 **MR. JACOBS:** No objection.

6 **MR. KAMBER:** 15, I believe, for infringement to be

7 proven the "elements" must be present, as per the claim

8 language. "The elements must all be present."

9 **THE COURT:** That's right. Okay.

10 How did you like my patented method about painting

11 the wall? I came up with that in a different case and just

12 carried it over. So far it has not been reversed by the

13 Federal Circuit.

14 (Laughter)

15 **MR. KAMBER:** Give it time, Your Honor.

16 **THE COURT:** Give it time.

17 Number 16?

18 **MR. JACOBS:** The second paragraph, we're not sure how

19 that -- whether we need that here or whether that's an issue

20 here. It just seemed like it could be stricken.

21 So to clarify, in the case of Google's direct

22 infringement here, we don't have any allegation, they have no

23 defense, that somebody else provided --

24 **THE COURT:** That's true. This is on direct

25 infringement. I think that second paragraph should come out.

1 **MR. KAMBER:** We agree, Your Honor.

2 **THE COURT:** All right.

3 So, number 17?

4 **MR. KAMBER:** Your Honor, we have another suggestion
5 with 16.

6 **THE COURT:** Sure.

7 **MR. KAMBER:** The second sentence towards the end,
8 starting at line 14:

9 "Patent owner's product or method is not a
10 defense to direct infringement."

11 **THE COURT:** All right.

12 **MR. KAMBER:** And, again, we have the language on line
13 15 about the limitations of the claim residing in the accused
14 product or method. We would just suggest something as simple
15 as "are found" or "are present."

16 **MR. JACOBS:** "Are present" is fine.

17 **THE COURT:** Okay.

18 17?

19 **MR. JACOBS:** So on 17, Your Honor, we would propose
20 some more clarification. You've done this from the bench.
21 You've told them how these charts work. We're concerned that
22 it may not yet be clear. So we would propose to add the
23 following to this paragraph. Let me read it quickly, and then
24 I'll read it more slowly.

25 "Google concedes that all of the claim

1 elements that are not underlined are present
2 in Android. Oracle contends that the
3 underlined elements are also present in
4 Android. Google disputes this contention.
5 Thus, the issue that you must decide to
6 determine direct infringement is whether
7 Oracle has proven that it is more likely than
8 not that the underlying elements are present
9 in Android."

10 **THE COURT:** I'm going to leave it just as it is,
11 except I will add this sentence at the end:

12 "Google concedes that the matter not
13 underlined is present in the accused ..."
14 What is it here, "method"? "Method"?

15 **MR. JACOBS:** Accused -- uhm, what are we calling
16 these? We're calling them --

17 **MR. BABER:** Products.

18 **MR. JACOBS:** Products.

19 **THE COURT:** "... products ..."

20 **MR. JACOBS:** Yeah.

21 **THE COURT:** "... but contends the underlined items
22 are absent."

23 Why isn't that good enough?

24 **MR. PAIGE:** That's fine with a proposed change
25 somewhere else in the instruction, Your Honor.

1 **THE COURT:** What change is that?

2 **MR. KAMBER:** The claim charts that we had this
3 discussion very early on in the trial, relate to the direct
4 infringement issue. And so I would posit that in top line:

5 "To assist you on the direct infringement
6 issue, counsel gave you a handout."

7 We don't -- again, we, Google, don't know --

8 **THE COURT:** That's true. You did say that. And I
9 acquiesced in that on account of it's conceivable that somebody
10 has changed the code. And your position is you don't know
11 whether they did or not. That's in dispute.

12 **MR. KAMBER:** Correct, Your Honor.

13 **THE COURT:** What do you say to that?

14 **MR. JACOBS:** I think that should stay in place.

15 **THE COURT:** On the direct infringement issue?

16 **MR. JACOBS:** Yes.

17 **THE COURT:** All right.

18 **MR. KAMBER:** And there's one typo, perhaps.

19 **THE COURT:** Okay.

20 **MR. KAMBER:** I think "satisfies" should say
21 "satisfy."

22 **THE COURT:** You're right.

23 All right. We need to break here because we're about
24 to get into indirect infringement. Aren't we?

25 **MR. JACOBS:** Yes.

1 **THE COURT:** This is a good, logical place, and I'll
2 see you back here at approximately -- if you're here by 3:20, I
3 bet I could start with you by then. So let's shoot for 3:20.

4 **MR. BABER:** Do you want us to clear the tables, Your
5 Honor?

6 **THE COURT:** Yes. I've got to hold some hearings.
7 (Whereupon there was a recess in the proceedings
8 from 1:58 until 2:21 p.m.)

9 **THE COURT:** Okay. All set over there?

10 **MR. BABER:** Gang is all here, your Honor.

11 **THE COURT:** Gang is here. We're back on the record.
12 We had got even up to No. 18.

13 **MR. JACOBS:** Your Honor, could I just go back a half
14 step? I'm not sure what you have at the end of 17, but we --
15 what we wrote down was: "Google concedes that matter" not
16 underlined.

17 **THE COURT:** Right.

18 **MR. JACOBS:** And we wanted to propose that: "Google
19 concedes that elements," not underlined, "are present."

20 **MR. KAMBER:** That's fine.

21 **THE COURT:** Fine.

22 Okay, 18.

23 **MR. JACOBS:** We have some --

24 **THE COURT:** I'm going to start No. 18 with a lead-in
25 that I haven't even given you, but I can see it needs a

1 transition.

2 I'm going to say: "So far I have been talking about
3 direct infringement. Now, I will address" -- no, "explain
4 indirect infringement." And then continue on as it already is,
5 unless you have further changes.

6 **MR. JACOBS:** Yes, your Honor.

7 **THE COURT:** What are those?

8 **MR. JACOBS:** On Lines 25 and 26.

9 **THE COURT:** Uh-huh.

10 **MR. JACOBS:** "A patented product or method is
11 indirectly infringed by a party who induces another party to
12 directly infringe or contributes to another party's
13 infringement."

14 So delete "either" and add a "to" to before
15 "directly" and after "infringe" add "or contributes to another
16 party's infringement."

17 **THE COURT:** I can see that the way we wrote it is
18 goofed up, but it says, "infringe by a party who." And then
19 start again slowly.

20 **MR. JACOBS:** "...who induces another party to
21 directly infringe or contributes to another party's
22 infringement."

23 **MR. KAMBER:** Your Honor, we're fine with that change
24 and agree with that addition. The only thing I would note is
25 that it's not a patented product or method that is infringed.

1 It's a patent claim. So it would be "a patented claim is
2 indirectly infringed."

3 **THE COURT:** All right.

4 **MR. JACOBS:** That's fine, your Honor.

5 **THE COURT:** Fine. That's good.

6 Okay.

7 **MR. BABER:** One second, your Honor.

8 **THE COURT:** I don't know where I got these. I
9 can't -- I hope I didn't have that in a prior case. The
10 Federal Circuit might reverse me on that one. "Patented
11 product or method."

12 Okay. What's next? On anything more on 18?

13 **MR. KAMBER:** No, your Honor.

14 **THE COURT:** Great. 19.

15 **MR. JACOBS:** Yes. So we would globally ask to delete
16 "end users." In the lead-in to the trial, we took out
17 "indirect infringement claims relating to end users." And so
18 that appears first in Line 4, but it appears throughout. If
19 you would like we can give you a --

20 **THE COURT:** If you want to drop it, I don't see why
21 the other side would care. You don't care if they drop that,
22 right? How about "developers"?

23 **MR. JACOBS:** "Developers" we need to include.

24 **THE COURT:** So we'll take out "end users" and say
25 "and developers of Android." All right? Now, where does it

1 show up again?

2 **MR. JACOBS:** It's going to come up --

3 **THE COURT:** "And developers."

4 All right. I see one, two, three, four -- it says --
5 no, three places in that paragraph after I have adjusted all of
6 them.

7 **MR. JACOBS:** And, yes, it comes up in -- it will come
8 up in 20 --

9 **THE COURT:** Okay. We'll do that, too. But anything
10 more on 19?

11 **MR. JACOBS:** No, your Honor.

12 **MR. KAMBER:** Yes, your Honor.

13 With respect to -- mobile device manufacturers are
14 obviously in the case. We have heard a lot about OEMs. I
15 don't believe we have heard any evidence about mobile service
16 providers and don't expect to hear any or, really, of
17 developers.

18 So we would just say that we think the indirect
19 infringement claims are targeted towards the OEMs, the handset
20 manufacturers.

21 **THE COURT:** Well, certainly, the way I see it, but I
22 can't say -- is there evidence about mobile service providers?

23 **MR. JACOBS:** Well, the mobile service providers sell
24 the phones at the end of the process.

25 **THE COURT:** I know. But is there evidence in the

1 record from which the jury can --

2 **MR. JACOBS:** That they actually sell?

3 **THE COURT:** -- that that actually -- I suspect you're
4 right about that, but that's just -- that's not something I
5 know from the record.

6 **MR. JACOBS:** Right. I'll have to check, your Honor,
7 whether somebody uttered those words.

8 **THE COURT:** If that's not in the record, we ought not
9 to have it in here. If there is enough in the record to
10 support the theory, then we'll leave it in. But if it's not
11 somewhere in the record, we ought to the to have it.

12 **MR. JACOBS:** I think what we have is a lot of Phase 1
13 evidence about who sells the -- about where the phones -- the
14 channel of distribution of the phones and role of mobile
15 service providers.

16 **THE COURT:** Have someone look that at least one
17 mobile service provider is called out in some way or as a group
18 they are called out.

19 **MR. JACOBS:** And then "developers," I think we have
20 talked about.

21 **THE COURT:** All right. I understand the "developer"
22 part.

23 Okay. Anything more on 19?

24 **MR. KAMBER:** "Developers." They are not developers
25 "of Android." They are developers "for Android."

1 **MR. JACOBS:** And maybe we should even make it better,
2 which is "application developers for the Android platform."

3 **MR. BABER:** Or just "developers who use Android."

4 **THE COURT:** All right. So now we go to 20.

5 **MR. JACOBS:** Nothing, your Honor.

6 **MR. KAMBER:** I think it's --

7 **THE COURT:** We have the end user problem.

8 **MR. JACOBS:** Yes. Other than that.

9 **THE COURT:** All right. Yes. Okay.

10 **MR. KAMBER:** And the same issue with mobile service
11 providers.

12 **THE COURT:** All right. That's to be determined.

13 **MR. KAMBER:** Right.

14 **THE COURT:** Anything else on 20?

15 **MR. KAMBER:** No, your Honor.

16 **MR. JACOBS:** No, your Honor.

17 **THE COURT:** 21.

18 **MR. JACOBS:** Okay. On 21 we have a lot of cases
19 since the -- since *Global Tech* came out. In those decisions
20 and in the model instruction the portion of the instruction
21 that is embodied in 2, under 21 reads "knew or should have
22 known." So that, "Google knew or should have known of the
23 asserted patent." And, actually, both parties proposed that in
24 their instruction.

25 **THE COURT:** Is that true? If that's true, I'm going

1 to go back to "knew or should have known."

2 **MR. KAMBER:** I believe that is true, your Honor.

3 **THE COURT:** Then that language goes in No. 2.

4 What's next?

5 **MR. JACOBS:** And then in terms of the third leg,
6 that, "Google knew its action would cause direct infringement
7 by another." In, for example, the Northern District of
8 California model instruction at 8.3.9 that reads, after another
9 quote, "or believe that it was highly probable its actions
10 would encourage infringement by another."

11 **THE COURT:** Is that the law? I will put it in if
12 it's the law. You tell me. The model instruction -- you know,
13 probably it's right, but...

14 **MR. PAIGE:** I'm not sure it's the law, your Honor,
15 but I think it's tied up with issues in Paragraph 23 on
16 willfully blindness.

17 **THE COURT:** I'm going to write it in for the moment.
18 What was that language again, "or believed"?

19 **MR. JACOBS:** Yes. "...believed that it was highly
20 probable its actions would encourage infringement by another."

21 **THE COURT:** "Would encourage"?

22 **MR. JACOBS:** Yes.

23 **THE COURT:** Well, tentatively I'm going to put that
24 in, but you say there is another issue later I have to look at
25 on willful.

1 So, all right. Anything else on 21?

2 **MR. JACOBS:** Just -- on 21 no, your Honor.

3 **THE COURT:** Anyone else on 21 by the defense?

4 **MR. KAMBER:** The only issue we would raise is an
5 ordering of the first and second paragraph, because the real --
6 sort of first question is if there has been direct infringement
7 by another. If there has been no direct infringement, there is
8 no point in going to the subsumed question about whether it was
9 induced.

10 **THE COURT:** No. I like the way this is set up now.
11 You know, you have a point and some people would do it the way
12 you want, but I think this is better.

13 **MR. JACOBS:** As a wording matter, your Honor, we
14 could shorten the second paragraph by adding -- by replacing
15 "was no infringement in the first place and" with "is."

16 So it would read:

17 "If you find that there has been no direct
18 infringement by another, then there is no
19 need for you to address the question of
20 induced infringement."

21 **MR. KAMBER:** No objection, your Honor.

22 **THE COURT:** All right. That will be the way it will
23 go.

24 No. 22.

25 **MR. JACOBS:** Same. The last proposal I would make,

1 your Honor, for 22, and take out the "of course." So in the
2 second paragraph of 22:

3 "If you find that there has been no direct
4 infringement by another, then there is no
5 need for you to address the question of
6 contributory infringement."

7 **THE COURT:** Okay. Done.

8 But the -- the elements on No. 22, you're okay with?

9 **MR. JACOBS:** Yes, your Honor.

10 **THE COURT:** 23.

11 **MR. JACOBS:** Nothing from us, your Honor.

12 **MR. PAIGE:** Your Honor, we don't believe the facts
13 here support a willful blindness instruction under *Global Tech.*

14 **THE COURT:** Why do you say that?

15 **MR. PAIGE:** I say that because *Global Tech* was quite
16 clear that to establish willful blindness there must be more
17 than just a known risk that induced acts are infringing and
18 that it requires active efforts by an inducer to avoid knowing
19 of the infringing nature of the activities.

20 The testimony we have here is that there was no
21 investigation conducted. That is not active actions, efforts,
22 to avoid knowing of something. That is simply doing what
23 pretty much every company in the country does, not going out
24 and looking for different patents from different companies.

25 **THE COURT:** Are you saying that this is not the law;

1 that 23 is not the law?

2 **MR. PAIGE:** I'm saying that 23 is the law in
3 situations like *Global-Tech*, your Honor, where you have someone
4 who goes to Hong Kong to buy an unmarked patented product and
5 then gives that product to their lawyer to do a -- to do a
6 freedom to use opinion, intentionally concealing from them that
7 this was a patented product. That is what happened in
8 *Global-Tech*.

9 This case is like *Apeldyn*. The *Apeldyn* case is
10 *Apeldyn vs AU Optronics* from Delaware. It's 2011 Lexis 134759.
11 We cited it in our motion in limine this past Sunday evening.

12 What happened in *Apeldyn* is exactly what happened
13 here, which is that it's a large company, has lots of patents,
14 doesn't go out and look for patents. Judge Robinson there
15 granted summary judgment of no willful blindness because just
16 not conducting an investigation cannot satisfy the standard of
17 willful blindness.

18 **THE COURT:** What do you say to that, Mr. Jacobs?

19 **MR. JACOBS:** These aren't the facts here. We did
20 brief this the other day.

21 The facts here are that there was an extended
22 licensing negotiation. During that negotiation, there was --
23 there's evidence that one of the concerns on the Google side
24 was resolving patent issues.

25 Later on after the launch of Android, Google

1 considered buying the rights to Java from Sun, patents,
2 copyrights, et cetera, in part because the result would be our
3 Java lawsuits go way.

4 So there's lots of indications of known risk here;
5 that is, that Sun had patents relating to the Java -- relating
6 to Java for present purposes and that in developing Android
7 without a license, Google was running significant patent risks.
8 Faced with that risk, what did Google do? Google's -- the only
9 evidence is that Google's head of Android told his troops,
10 "Don't look at patents" and did no patent study himself. And
11 Google has asserted the attorney-client privilege over any
12 study that may have been done -- may have been done, I
13 emphasize -- by the legal department.

14 So our record is lots of awareness of risks, a plan
15 to license Java, and then a departure from that when the
16 negotiations fail; but no effort to address those known patent
17 risks, even while adopting an architecture in which Mr. Rubin
18 refers to the Dalvik Virtual Machine as late as 2009 as a Java
19 Virtual Machine.

20 **THE COURT:** Do these patents call out the virtual
21 machine in the specifications or is it more generic?

22 **MR. JACOBS:** In the '104 patent we have the
23 additional evidence that Mr. Lindholm was aware of the
24 predecessor of the '685.

25 In the '104 patent it refers to machine independent

1 object code. You'll recall that claim interpretation issue.
2 And the virtual machine and the interpreter, that the language
3 there is an interpreter. So that's the -- that's not virtual
4 machine, but it's an interpreter and we've heard lots of
5 testimony about how virtual machine is an interpreter.

6 And then when it comes to the '520 patent, it's very
7 direct because the '520 patent is about dealing with the output
8 of the Java compiler. And Google in the Android SDK tells its
9 developers, "Download the Java compiler." "Download the Java
10 compiler." We heard testimony today that it could be "a Java
11 compiler." But we notice the output of a Java compiler
12 presents this problem of these large static arrays that need --
13 in order to run efficiently, need to be reduced. And that's
14 what the '520 patent does.

15 I hope that's what you're getting at.

16 **THE COURT:** Does any patent refer to the virtual
17 machine?

18 **MR. JACOBS:** The '520 patent, I'm quite confident,
19 refers to the Java Virtual Machine.

20 The '104 patent goes back to 1992 before the Java
21 Virtual Machine was actually introduced. So it does not refer
22 to a Java Virtual Machine by name. That's the one that
23 Mr. Lindholm wrote the chapter about.

24 **THE COURT:** Well, Lindholm was not on the team.

25 **MR. JACOBS:** Lindholm was not a developer. Lindholm

1 was an advisor on, among other things -- what was the phrase
2 that we saw the other day -- the business, technical, legal
3 environment. He actually used the word "legal" in his email to
4 Andy Rubin about the role he could play and did play in those
5 negotiations.

6 And then, of course -- well, we know how Lindholm's
7 role unfolded over time.

8 So we have lots of knowledge of -- at Google that
9 there is a risk of patent infringement here. And then in the
10 face of that risk an instruction, "Don't look."

11 Now, what Google argues as well there are patents --
12 Rubin said, "Well, I couldn't study IBM and all these other
13 companies," but that's not the point. It's not -- *Apeldyn* is
14 about a case in which there was not this intense prior
15 interaction.

16 *Global-Tech* is a case about where there is -- about
17 an intense knowledge, close focus on the competitive product by
18 the defendant. And that's, of course, our situation here.

19 **THE COURT:** Did Mr. Rubin say -- the way you phrased
20 it there, did Mr. Rubin affirmatively say, "Don't go out and do
21 a search," or is it just that he never told them to do a
22 search.

23 **MR. JACOBS:** The latter.

24 **MR. PAIGE:** The latter, your Honor.

25 **MR. JACOBS:** I'm sorry. I'm sorry. No, I'm sorry.

1 The former. He said --

2 **MR. PAIGE:** No, that's not right.

3 **MR. JACOBS:** He said he didn't search and he said,
4 "Do this on our own without looking at other company's stuff."
5 That's at least part of the record we have.

6 And then we played his deposition in which it was
7 even stronger in that testimony --

8 **THE COURT:** What did he say? What's the strongest
9 you have that he affirmatively directed someone not to do a
10 search for prior art -- for other people's IP?

11 I thought the way it was phrased was that he did not
12 do a search, but that's not the same as directing other people
13 not to do a search, affirmatively directing.

14 **MR. JACOBS:** Of course, he's in charge, so not giving
15 a direction to do a search when he has resource allocation
16 responsibilities is pretty close to the same thing.

17 **THE COURT:** Possibly that's an argument, but it's a
18 step removed.

19 **MR. JACOBS:** I think he has testimony -- there is
20 various formulations of it, which is why I'm having trouble
21 grasping the exact language of the strongest version.

22 **THE COURT:** Don't guess at it then.

23 So let me ask the Google side this question. Is
24 there a decision by the Federal Circuit or the Supreme Court
25 that says the theory just articulated is not enough?

1 **MR. PAIGE:** There is, your Honor. *Global-Tech*
2 itself.

3 I mean, you hit the nail on the head. You asked
4 Mr. Jacobs: What are we doing to show active efforts by an
5 inducer to avoid knowing of the infringing nature of the
6 activities? That's the language from *Global-Tech* itself at
7 Page 2071 of the *Supreme Court Reporter*. And what he said was,
8 Well, they didn't do a search and they decided not to search.
9 He said twice in his remarks that they didn't do something.

10 What *Global-Tech* says is that there was an error in
11 the Federal Circuit's opinion because:

12 "In demanding only deliberate indifference to
13 that risk, the Federal Circuit's test does
14 not require active efforts by an inducer to
15 avoid knowing about the infringing nature of
16 the activities."

17 In *Global-Tech* they went to Hong Kong and bought a
18 frying pan that would not have U.S. patent markings on it to
19 show to their counsel so the counsel wouldn't know of the
20 patents. That's active. Not doing a search is not active,
21 that's passive at best.

22 And you will find no case -- certainly, none of the
23 cases they cited in opposition to our motion in limine --
24 applying *Global-Tech* in this situation.

25 **THE COURT:** But if you're right about that, then this

1 whole indirect thing should go out the window.

2 **MR. PAIGE:** It should, your Honor. The evidence
3 hasn't supported it.

4 **MR. JACOBS:** No, your Honor, because after July 20th,
5 they are on specific notice of the patents in question.

6 **MR. PAIGE:** Yes, your Honor. That I do agree with.
7 Once you have notice on July 20th forward, that's correct.

8 But as to prior to July 20th, where there was
9 undisputedly no notice given to the holder of these patents --

10 **THE COURT:** Don't we need to then have a verdict form
11 that asks for the before and after? How do we deal with that
12 problem?

13 **MR. PAIGE:** I'm not sure we do your Honor. I'm not
14 sure there is any dispute that there was any notice before
15 July 20th. I don't believe there is.

16 **THE COURT:** Let's find out.

17 Are you seeking damages for prior to that date?

18 **MR. JACOBS:** I think that this is -- I don't know,
19 your Honor. I asked that question to prepare and I did not get
20 a crisp answer.

21 **THE COURT:** Well, what good will it do us to get --
22 look, if they knew after the July meeting in 2010 about these,
23 they were on notice of the patents, why isn't is that enough?

24 **MR. PAIGE:** Well, your Honor, just knowledge of the
25 patents isn't enough. As you know, you need to have knowledge

1 that your inducing acts are intended to create infringement.
2 And so if you reasonably believe that you were not infringing
3 because you have, you know, defenses to it in terms of
4 infringement, then the jury could determine that they didn't
5 intend to induce.

6 It's perfectly possible to say, A, you infringed; at
7 the same time, B, you reasonably believed what you were doing
8 might not have infringed and, therefore -- but that's a jury
9 question, your Honor.

10 **THE COURT:** Mr. Baber, what do you have to say?

11 **MR. BABER:** Your Honor, I was going to -- I was just
12 going to read Mr. Rubin's testimony from Tuesday of this week,
13 Mr. Jacobs' examination about whether he did anything active or
14 just didn't do things.

15 **THE COURT:** But that's not the deposition, but go
16 ahead.

17 **MR. BABER:** I'm reading now from the transcript Page,
18 3140.

19 **"QUESTION:** Mr. Rubin, did you ever do any
20 review during the development of Android to
21 investigate Sun's patent portfolio?

22 **"ANSWER:** Only in -- only, you know, days
23 before the suit was filed.

24 **"QUESTION:** And that was on account of a
25 meeting that was held between Oracle and

1 Google on July 20th, 2010; correct, sir?

2 "ANSWER: I'm not sure of the exact date.

3 "QUESTION: A meeting that was held between
4 the legal teams to discuss patents; correct,
5 sir?

6 "ANSWER: Yes.

7 "QUESTION: And so during the development of
8 Android, you didn't do any review of Sun
9 patents yourself; correct, sir?

10 "ANSWER: Yes, that's correct.

11 "QUESTION: And you never asked -- I'm
12 leaving aside what the legal department might
13 have done. You never asked anyone on your
14 team to do a review of Sun patents, is that
15 correct?

16 "ANSWER: No, sir.

17 "QUESTION: No, you did not do that, correct?

18 "ANSWER: I did not ask for that, that's
19 correct."

20 MR. JACOBS: Mounting the evidence further, your
21 Honor, we really assembled this in the motion in limine
22 opposition. Recall emails along the lines of one option was to
23 proceed without a license and risk making enemies.

24 This is very much like the case of *Global-Tech* and
25 telling -- and not doing any kind of patent study when you're

1 cloning somebody else's product is willful blindness.

2 **MR. PAIGE:** Your Honor, the idea that we're cloning
3 this after the testimony we've heard about how different the
4 Dalvik and Java Virtual Machines are is sort of facetious, but
5 the point here is that there is no case --

6 **THE COURT:** The Dalvik machine could be totally
7 different but still infringe.

8 **MR. PAIGE:** Right. But what Mr. Jacobs just said was
9 that this is something that's cloned and that's why they needed
10 to watch out, why they were required to go out and do a bunch
11 of searches.

12 And just to address the licensing point briefly. As
13 your Honor knows, this wasn't coming to Sun and saying, "we
14 would like a license." This was a partnership deal that was
15 being discussed, and the fact that there would be a license
16 arising out of a partnership is not the same as saying, We are
17 looking for your IP only, as opposed to work together with you.

18 **THE COURT:** All right. I'm going to leave 23 in. I
19 think there is enough evidence, but I do request that you clear
20 up tomorrow whether you're seeking damages prior to that July
21 meeting.

22 **MR. JACOBS:** Thank you, your Honor.

23 **MR. PAIGE:** Your Honor, if it stays in, I would like
24 to just clarify what the language is, which is that it says:
25 "Actual knowledge or was willfully blind and willfully blind

1 itself to a fact."

2 I suspect that there will be arguments made about
3 what that fact is. It surely can't be the fact that Sun had
4 patents, for example.

5 I think it should have to be knowledge of the
6 patents-in-suit of the '104 and the '520 patents and that it
7 willfully blinds itself to that information, the existence of
8 those patents.

9 **THE COURT:** Well, what do you say to that?

10 **MR. JACOBS:** All the cases use this formulation,
11 including *Global-Tech*, your Honor. They all say Google
12 took deliberate actions -- willfully blinded itself to a fact.

13 **THE COURT:** If you propose an alternative, I will
14 consider it, but right now I'm going to leave it in. Because
15 earlier we say, don't we, that it's got to be knowledge of the
16 -- "knew or should have known of the asserted patent."

17 **MR. PAIGE:** That's why that should be down there as
18 well, your Honor.

19 **THE COURT:** "And should cause direct infringement or
20 believe that it was highly probable." And so --

21 **MR. PAIGE:** That's why that statement of the facts
22 should be down there, to make clear that this is the fact we're
23 talking about, not the fact that Sun had patents, which I
24 expect would be something they would try to argue.

25 **THE COURT:** Well, No. 4 above says that, "Google

1 supplied the component with knowledge of the asserted patents."
2 So it is knowledge -- the fact that we're talking about in that
3 context is knowledge of the asserted patents.

4 **MR. PAIGE:** I think that's the fact we're talking
5 about in any context for 23, your Honor, so it should be in 23
6 so the jury is not confused.

7 **MR. JACOBS:** Your Honor, I think what Mr. Kamber
8 [sic] is worried about is an argument, not any problem with the
9 instruction because the instruction is repeatedly stated
10 exactly as this in case after case.

11 So we would urge that we don't introduce the
12 possibility of error by changing that instruction.

13 **THE COURT:** Well, I don't think it would be error.
14 Why would it be error to say in No. 23, "to show that Google
15 willfully blinded itself to the fact of the asserted patents"?

16 **MR. JACOBS:** "To the existence of those patents."

17 **THE COURT:** Or, "to the existence of the asserted
18 patents." What's wrong with that?

19 **MR. JACOBS:** That's fine, your Honor.

20 **THE COURT:** All right. We'll put that in.
21 "Willfully blinded itself to the existence of the asserted
22 patents."

23 **MR. PAIGE:** And then, your Honor, it should be also
24 continuing down to, "subjectively believe there was a high
25 probability that the asserted patents existed and took

1 deliberate actions to avoid learning of the asserted patents."

2 **MR. JACOBS:** Then I think we're larding it on, your
3 Honor.

4 **THE COURT:** Well, no. If I change it in one place,
5 I've got to go through "asserted patents existed" and took --
6 "of learning of the asserted patents."

7 **MR. JACOBS:** What we've done -- the reason this is
8 problematic if overstated is it penalizes a company that has a
9 large patent portfolio like Sun did. Their argument is going
10 to be, "How did we possibly know of those two in a portfolio of
11 hundreds?"

12 **MR. PAIGE:** The actual knowledge is required.

13 **THE COURT:** I think, though, that that's the problem
14 of a company with a lot of patents, because I think the law
15 does require knowledge that the patent is in suit, or willful
16 blindness to that.

17 So if all you can prove is that we had a large
18 portfolio and surely they must have known about one of them, I
19 don't know; that's not as good as if you can narrow it down.

20 But you listed some evidence that seemed to narrow it
21 down, so maybe you'll do okay with this. But I think the
22 change that we made to 23 is a good one.

23 All right. Now we're going to 24.

24 **MR. PAIGE:** One important thing, your Honor.

25 **THE COURT:** What's that?

1 **MR. PAIGE:** Is it possible to have in the instruction
2 the following language from *Global-Tech* itself saying that:

3 "It's not enough under the law to show that
4 Google was negligent or even recklessly
5 indifferent to the fact."

6 This is a very high standard. And the jury needs to
7 understand that.

8 **MR. JACOBS:** Your Honor, I have three Northern
9 District cases in front of me, and cases from other
10 jurisdictions --

11 **MR. PAIGE:** I suspect, your Honor --

12 **MR. JACOBS:** Other District Cases that state the rule
13 exactly as it's stated in the original draft of this
14 instruction.

15 **MR. PAIGE:** I suspect, your Honor, that none of them
16 upheld anything like this. They might have quoted *Global-Tech*,
17 which has existed for less than a year at this point. The
18 first time that --

19 **THE COURT:** You give me the language you want and
20 show me where it is in *Global-Tech* and I will consider it, but
21 I'm not agreeing to it yet.

22 **MR. PAIGE:** Thank you, your Honor.

23 **THE COURT:** All right. 24.

24 **MR. JACOBS:** Nothing, your Honor.

25 **THE COURT:** 25 --

1 **MR. KAMBER:** Actually, your Honor, we have two very
2 small edits or suggestions on 24.

3 The second sentence, "Although the special verdict
4 form analyzes is the questions in numerical order." I would
5 say "presents."

6 **THE COURT:** Presents.

7 **MR. KAMBER:** And in the line on 19 it says, "The
8 questions you put ultimately answer, which questions are only
9 conditional depending on your other answers." So adding
10 "questions" in between the "which" and the "are."

11 **THE COURT:** I'm lost. I don't understand what you're
12 asking me to do.

13 **MR. KAMBER:** So let me start reading on line 18:

14 "So long as your answers conform to the
15 directions on the form concerning which
16 questions you must ultimately answer and
17 which questions are only conditional
18 depending on your other answers."

19 **THE COURT:** All right. That's good.
20 No. 25.

21 **MR. JACOBS:** Nothing, your Honor.

22 **THE COURT:** I have a small thing on 25 that doesn't
23 require change yet, but, you know, we have all of the Phase 1
24 exhibits and they are entitled to see any of them that they
25 want, but I am a little worried about overloading them in

1 there.

2 But do you two think that we just take all the
3 Phase 1 and all the Phase 2 exhibits back in again?

4 **MR. JACOBS:** I think so, your Honor.

5 **MR. KAMBER:** I think so, your Honor.

6 **THE COURT:** All right, fine. I'm going to then say:
7 "All the exhibits received in evidence,
8 including from Phase 1."

9 How is that?

10 **MR. JACOBS:** Yes, your Honor.

11 **MR. KAMBER:** Yes.

12 **THE COURT:** So that means you're going to need to get
13 an index for the new ones.

14 **MR. JACOBS:** Will do, your Honor.

15 **THE COURT:** 26.

16 **MR. JACOBS:** No changes.

17 **MR. KAMBER:** Your Honor, I'm just going to short
18 circuit it from our perspective. We have no more changes for
19 the rest of this document.

20 **MR. JACOBS:** Same with us, your Honor.

21 **THE COURT:** Then let's go to the special verdict
22 form.

23 Any problems on the special verdict form?

24 **MR. KAMBER:** Yes, your Honor, we have. If I could
25 just pass up to, your Honor.

1 (Whereupon, document was tendered
2 to the witness.)

3 **MR. KAMBER:** It's a little bit rough because it's
4 something we worked up during the break from before.

5 We mentioned the issue about the phones and
6 particular phones that are accused. They are a category of
7 phones accused of direct infringement and another category of
8 phones that were accused of indirect infringement. And the way
9 that we've tried to do this on what we just handed up was to
10 have the direct infringement question directed to those -- that
11 category of phones that is the Nexus One, the Nexus S, the
12 Motorola Droid, and Oracle also accuses the SDK of infringing
13 the '104 patent.

14 **THE COURT:** How come we don't have 27 and 29 in
15 there?

16 **MR. KAMBER:** So that is another suggestion that I
17 have.

18 The jury is hearing two different theories on two
19 different sets of claims for the '104 patent, and so it's is
20 slit into 1A and 1B.

21 The first, 1A, relates to the Resolve.c for claims
22 11, 39, 40 and 41. And 1B relates to the dexopt theory for 27
23 and 29, because there is an additional non-infringement
24 argument for the dexopt theory. It's an effort to kind of just
25 help the jury with this process.

1 **THE COURT:** All right. Let's pause there.

2 This seems like a good idea to me to break it out by
3 product. So that that will help us on the damages part, won't
4 it?

5 **MR. JACOBS:** It's become a very complicated jury
6 form, your Honor, with a lot of different decisions for them to
7 make.

8 I thought the original draft was -- struck a happy
9 medium between some level of specificity. We can, of course,
10 take out Claims 8 and 12 and tighten it up even further without
11 getting down into very granular set of decisions. This is now
12 a one, two, four by four -- 16-item matrix for the 1A. 1B is
13 an 8-item matrix. 3A is, again, a 16-item, and 3B is an
14 8-item. It's just more than is needed here.

15 **THE COURT:** But what if the jury were to, say, find
16 that you proved it on Nexus One and Nexus S, but not the other
17 ones? And wouldn't that affect damages?

18 **MR. JACOBS:** If the -- any time a jury gets very
19 specific in a verdict form, of course, of it can potentially
20 affect damages, your Honor.

21 **THE COURT:** But that --

22 **MR. JACOBS:** I think you've got it close enough with
23 indirect infringement on your verdict form.

24 **THE COURT:** But then the expert testimony, is it
25 broken down by these cell phone manufacturers?

1 **MR. JACOBS:** I guess in some sense we're taking a
2 little bit of a risk here, your Honor. This is a composite of
3 evidence on indirect infringement, including Dr. Mitchell's
4 specific evidence of his specific testing of specific phones,
5 which we then argue is indicative of the rest of the phones.

6 So if Google wants to take the weakest link in the
7 chain and say, "They haven't proven indirect infringement
8 because here is a phone that he didn't even test," well, that
9 could be an argument they could make.

10 But I don't think the jury was taking notes at the
11 phone level. I would be surprised if they were. It came
12 across very quickly. And it would seem to us to be sufficient
13 to have the claim-by-claim analysis for indirect infringement.

14 **THE COURT:** Well, I am not understanding this, just
15 because it's late in the day, but how do the experts pitch
16 their infringement damages as it applies to the cell phone
17 manufacturers?

18 **MR. JACOBS:** The -- there is a calculation in which
19 on account of the Court's ruling limiting the scope of the
20 phones that are in dispute for indirect infringement purposes a
21 reduction is taken in the calculation of the hypothetical
22 license amount. It is, I believe, aggregated across the
23 remaining -- on the basis of the remaining phones and not
24 atomized phone-by-phone, amount of advertising revenue by
25 phone. That would not be -- that would not have been possible

1 in any case.

2 **MR. KAMBER:** Your Honor, the fact that Dr. Cockburn
3 may not have analyzed separately the specific phones and the
4 damages related to specific phones is -- may be a failure of
5 proof issue, but at this point it's certainly true that they
6 have their -- they are down to a certain set of phones. It's
7 eight phones. The damages are calculated based on those eight
8 phones.

9 If jury were only to come back on, for example, half
10 of those phones for whatever reason, it may be because of the
11 split between direct infringement and indirect infringement
12 based on knowledge of the patents. Then Dr. Cockburn may have
13 to -- or the other damages experts may have to revise their
14 opinions accordingly.

15 But certainly the proof, the burden of proof is on
16 phones. We're not talking about Android generally here. We're
17 talking about specific phones that are accused in two different
18 categories of phones, at least, that are accused.

19 **THE COURT:** Well, I don't know. I'm going to think
20 about it.

21 But I have this question: Do you at least agree that
22 this line-up of claims and phones is correct?

23 **MR. JACOBS:** No. We will have to check that, your
24 Honor.

25 **THE COURT:** All right. Putting aside that -- that

1 aside for a moment. Do you see that the way I have the one I
2 did set up? If they answer no infringement on question one and
3 no infringement on question two, they don't even reach the
4 indirect.

5 **MR. KAMBER:** That's actually --

6 **MR. JACOBS:** Go ahead. I think maybe we both...

7 **MR. KAMBER:** We probably agree here, so I don't want
8 to speak for Mr. Jacobs.

9 **THE COURT:** You want me to take that out?

10 **MR. JACOBS:** Yes, please.

11 **MR. KAMBER:** Yes, please. Because it's a different
12 set of phones, your Honor.

13 **THE COURT:** All right.

14 **MR. JACOBS:** I think we agreed, but for different
15 reasons.

16 **THE COURT:** All right. That's fine.

17 **MR. JACOBS:** And then, again, we can take out Claim 8
18 and 12 from the '520.

19 And on the other point that Google was making about
20 distinguishing between dexopt and Resolve.c, I think the
21 verdict form gets highly technical in the way that they are
22 proposing. We thought that the answer is -- would lay in our
23 decision to divide up the claims, so we don't have '104 claims
24 that are targeted at both dexopt and the bytecode interpreter.
25 In that way we'd cover by dividing the claims, the separate

1 theories that Google can argue and we can argue to the jury
2 this is what these claims read on and this is why you should
3 rule in our favor or their favor.

4 **MR. KAMBER:** Your Honor, frankly, we leave this one
5 to your judgment. We thought it might help the jury because
6 they are hearing two different theories.

7 If you feel as though the verdict form is overly
8 complicated, then so be it. They can have it and we can argue
9 it and try to explain it as best as we can in the closing
10 arguments.

11 **THE COURT:** I will do this. I'm going to leave it
12 the way it is, the way I have it with some of the changes you
13 you made.

14 But I say to plaintiff. If in jury room -- if we get
15 to the damages phase, they may come back with a tiny number and
16 the number may not square with what you're expecting, and the
17 reason might be that they didn't they you proved up -- I'm sure
18 we're going to hear in the closing argument that you didn't
19 prove up Nexus One and SDK and so forth. And this would have
20 been a way to smoke that out. And you should not be arguing
21 for a new trial or something based on inadequacy of the damage
22 award.

23 **MR. JACOBS:** Understood. I understand the point
24 you're making, your Honor.

25 **THE COURT:** Okay. I guess we're done for now.

1 Let's talk about the amount of time you need for
2 closing argument.

3 **MR. JACOBS:** I think an hour would be sufficient,
4 your Honor.

5 **MR. KAMBER:** I think we would agree, your Honor.

6 **THE COURT:** What?

7 **MR. KAMBER:** We would agree, your Honor.

8 **THE COURT:** One hour. Well, you know, I'm willing to
9 give you the time you want. So I don't like it when the
10 lawyers blame me later.

11 **MR. JACOBS:** All right. An hour and a quarter, your
12 Honor.

13 **MR. KAMBER:** Done.

14 **THE COURT:** All right, an hour and a quarter. But,
15 you know, when the time runs out, the time runs out and if
16 things are left on the table, that's just the way it is. So,
17 all right. An hour and a quarter. You both agree to that, I
18 think that's reasonable.

19 And where do we stand on finishing the evidence
20 tomorrow?

21 **MR. KAMBER:** I believe we may close our case
22 tomorrow. It just depends a little bit on the speed of things.

23 **THE COURT:** Do you have an expert?

24 **MR. KAMBER:** We have -- we have two experts; one on
25 the '520 patent and one on the '104 patent.

1 **THE COURT:** Now, you remember I need to break about
2 12:10 tomorrow.

3 **MR. KAMBER:** Right.

4 **THE COURT:** So I've got to be someplace at -- over in
5 the East Bay. So taking that into account, you still think
6 we'll finish?

7 **MR. JACOBS:** We have a rebuttal case. That's what I
8 want to make sure we don't lose sight of.

9 **THE COURT:** Remember, you only have about --

10 **MR. JACOBS:** We're in good shape actually, your
11 Honor.

12 **THE COURT:** All right. You're in good shape, okay.

13 **MR. JACOBS:** It's possible we'll go into Monday and
14 then propose closing on Tuesday?

15 **THE COURT:** No. If we have enough time, we'll start
16 the arguments on Monday.

17 **MR. JACOBS:** Okay.

18 **THE COURT:** I think, you know, you have the weekend
19 to get ready.

20 Now, if we were to get close to the end of the day on
21 Monday, of course, I'd stop; but if we have two hours left, I
22 think we ought to get one of the closings done so that they
23 won't have all that closing time the next day. We will just
24 have to play that by ear and see.

25 Okay. Good.

1 **MR. KAMBER:** Your Honor, one loose point. You asked
2 after the close of the evidence by Oracle to have the -- any
3 oral motions for judgment.

4 **THE COURT:** I need to know -- what are the points?
5 Here everybody sit down. What are the points on your
6 Rule 50?

7 **MR. KAMBER:** For the Rule 50?

8 **THE COURT:** So you have to articulate what the
9 Rule 50 is.

10 **MR. KAMBER:** Mr. Weingaertner is going to do that,
11 your Honor.

12 **MR. WEINGAERTNER:** Thank you.

13 First of all, on no direct infringement under the
14 '104 patent due to improper claim construction or undisclosed
15 equivalent infringement, that is an undisclosed equivalent
16 infringement theory.

17 Same for the '520. Undisclosed equivalent
18 infringement or improper claim construction.

19 **THE COURT:** No equivalent -- there is no doctrine of
20 equivalence in this case.

21 **MR. WEINGAERTNER:** That's right, your Honor. And we
22 believe they've made an equivalent argument in order to try to
23 meet the limitations of the claim.

24 **THE COURT:** I'm certainly not instructing on doctrine
25 of equivalence.

1 **MR. WEINGAERTNER:** Exactly, your Honor.

2 **THE COURT:** All right. Go head, continue.

3 **MR. WEINGAERTNER:** And this is to preserve it,
4 obviously, your Honor, but thank you.

5 Also under 35 USC Section 271(b) no inducement due to
6 lack of actual knowledge or willful blindness and no proof of
7 actual inducement.

8 And then no underlying predicate acts of infringement
9 for any of the handsets accused in this case which have been
10 stated.

11 Then also under Section 271(c) no contributory
12 infringement, in that software via delivered the Internet is
13 not a component under controlling Supreme Court precedent. And
14 software is not sold under other precedent, that was cited
15 earlier.

16 And, finally, we have a separate motion, Your Honor,
17 for the '104 Patent, which relates to an improper late
18 broadening of the claims of the '104 Patent.

19 That issue is now being considered by the Federal
20 Circuit. The Federal Circuit ruled unfavorably to us, but the
21 Federal Circuit seems to have, essentially, invited rehearing
22 *en banc*. And the Patent Office has just recently filed an
23 extension to file its request for a hearing *en banc*. We think
24 it will be overturned.

25 **THE COURT:** "Late broadening," where does that occur?

1 **MR. WEINGAERTNER:** Well, Your Honor, you're allowed
2 to broaden the patent if you file within two years of the issue
3 date. In the '104 case, it was filed more than two years
4 later.

5 **THE COURT:** That wouldn't affect the way we try the
6 case now.

7 **MR. WEINGAERTNER:** No, Your Honor. It's purely a
8 question of law. We just wanted to preserve it.

9 **THE COURT:** Thank you for making that statement.
10 Mr. Jacobs, you don't have to respond. But if you
11 feel one of those issues is something you need to reopen on,
12 you ought to let us know promptly.

13 **MR. JACOBS:** The only issue that I think bears
14 commenting on is the claim construction argument lurking in
15 Google's motion.

16 Google seems to be advocating a claim construction
17 that is inconsistent with the Court's claim construction order
18 or the plain language of the claims.

19 And we haven't articulated to you what the lurking
20 claim construction issues here are, or asked for instructions
21 on that point.

22 In the case of the '104, the key language is "of the
23 data," and are we referring to the actual data, to use the last
24 witness's words, or are we referring to anything that happens
25 to arguably be residing in an area that gets labeled "data."

1 In the case of the '520, there's a lurking argument
2 that static initialization requires the use of a stack, based
3 on the embodiment in the specification. We saw that today, as
4 well.

5 Where we are on this is that no instruction is needed
6 to the jury because the claim language of the claims in the
7 case of the '520 or the '104 claim construction -- in other
8 words, the plain language of the Court's claim construction on
9 the '104 are clear on these points.

10 But it may be that before closing argument we need to
11 seek direction from the Court on improper closing arguments.
12 We don't want Google arguing contrary to the claim construction
13 in closing argument.

14 They've raised -- they're arguing that -- they are
15 making a motion based on some impropriety in our use of the
16 claims in the claim construction, so there's something lurking
17 as yet unstated --

18 **THE COURT:** I'm telling them, you must accept and use
19 these meanings in your deliberations. And then I give them
20 three already.

21 No one has asked for any other claim constructions.
22 If you want me to put in a sentence that would say as to
23 anything else it has its plain meaning as used in the patent, I
24 can do that.

25 But I don't -- you can't sandbag me at the last

1 minute and say, Judge, please give us a ruling on what "data"
2 means. That would take me some time to sort out.

3 So if -- you know, this was the time to ask me for
4 it. I guess you could -- for good cause you could ask for it
5 later. But, it would have to be really good cause to say at
6 the last minute you want me to go research a legal point and do
7 a claim construction.

8 But I hear you saying you're happy with the plain
9 language.

10 **MR. JACOBS:** We're happy with the plain language of
11 the claim and the claim constructions.

12 As this develops over the next day, it may seem wise
13 for us to ask you to consider restricting the scope of closing
14 arguments so that they adhere to the claim constructions or to
15 the plain meaning.

16 **THE COURT:** Well, do you plan to deviate from the
17 claim constructions that the Court gave?

18 I will tell you this now, if I think you are I will
19 interrupt you in the middle of the closing argument and say
20 that, what counsel is instructing you on is not the law.

21 **MR. KAMBER:** We do not plan to deviate from the claim
22 construction, Your Honor.

23 But, I do agree that there's a lurking issue in the
24 sense that, not surprisingly, we're in the realm of meta claim
25 construction, where we believe that Oracle is taking a position

1 that talks about the ultimate data location or the end place of
2 a piece of data.

3 Your construction of "symbolic reference" says that
4 it's a reference that identifies data by a name other than the
5 numeric memory location of the data.

6 We understand that that -- "the data," sort of like
7 in the context of a patent, is referring back to "said data,"
8 the data that you just introduced in your definition. And that
9 is resolved dynamically rather than statically.

10 Now, Oracle says "the data" is something that you're
11 looking for at the end of the end of the end of a long chain.
12 But even the stuff that they point to isn't the end of the end
13 of a long chain. There's even more of a chain after that.

14 We say that this construction is saying a symbolic
15 reference is one that identifies by a name, other than a
16 location, a numeric memory location of the data.

17 So perhaps you'll remember, Your Honor, the Markman
18 hearing was -- a lot focused on, What is a symbolic reference?
19 Is it a name? Is it a location?

20 And we understand this construction, especially based
21 on the comments in the order and the explanation for the claim
22 construction, to support that view. But agree that Oracle and
23 Google seem to be a little bit passing ships -- ships passing
24 in the night when it comes to this.

25 **THE COURT:** So leave it exactly the way it is unless

1 a formal motion is made and adequate briefing is given to me.

2 You can't spring something that important on me at
3 the last minute. So I'm not going to do this on an oral basis.
4 You need formal motions if you're going to do it.

5 **MR. KAMBER:** Understood, Your Honor.

6 **THE COURT:** Yes.

7 **MR. WEINGAERTNER:** Your Honor, if I might add one
8 additional point for the judgment as a matter of law. And that
9 would be under the '520 Patent, no contributory infringement
10 due to substantial non-infringing use.

11 I forgot that earlier. Thank you.

12 **THE COURT:** Thank you. All right. See you in the
13 morning.

14 **MR. JACOBS:** Thank you, Your Honor.

15 **MR. PAIGE:** Your Honor.

16 **THE COURT:** Yes, sir.

17 **MR. PAIGE:** You had requested that we send you
18 language for the willful blindness instruction. How should we
19 do that?

20 **THE COURT:** How about filing it tonight.

21 Also, Mr. Jacobs, you were going to give me the
22 Android and the Java sets of some class that you wanted me to
23 look at.

24 **MR. JACOBS:** Yes. Those have been filed, I'm told,
25 Your Honor. What we still owe you is our -- we're doing a

1 careful count for the chart.

2 **THE COURT:** All right. Thank you.

3 (At 4:15 p.m. the proceedings were adjourned until
4 Friday, May 11, 2012, at 7:30 a.m.)

5 - - - - -

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

E X H I B I T STRIAL EXHIBITSIDENVOL.EVIDVOL.

46.106			3626	20
47.24			3581	20
47.25			3581	20
128			3446	20
139			3446	20
201			3446	20
206			3446	20
208			3446	20
530			3447	20
531			3447	20
537			3447	20
582			3447	20
1001			3576	20
1058			3447	20
1094			3581	20
2078			3447	20
2081			3447	20
2308			3447	20
3137			3447	20
3138			3447	20
3153			3447	20
3154			3447	20

I N D E XPLAINTIFF'S WITNESSESPAGEVOL.**MITCHELL, JOHN**

(PREVIOUSLY SWORN)	3461	20
Direct Examination Resumed by Mr. Jacobs	3461	20
Cross Examination by Mr. Van Nest	3474	20
Redirect Examination by Mr. Jacobs	3530	20
Recross Examination Resumed by Mr. Van Nest	3541	20
Further Redirect examination by Mr. Jacobs	3545	20

BORNSTEIN, DANIEL

(SWORN)	3546	20
Direct Examination by Mr. Jacobs	3546	20
Cross Examination by Mr. Paige	3586	20
Redirect Examination by Mr. Jacobs	3597	20
Recross Examination By Mr. Paige	3600	20

- - -

DEFENDANT'S WITNESSESPAGEVOL.**BORNSTEIN, DANIEL**

(PREVIOUSLY SWORN)	3601	20
Direct Examination by Mr. Paige	3602	20
Cross Examination by Mr. Jacobs	3613	20

MCFADDEN, ANDY

(SWORN)	3616	20
Direct Examination by Mr. Kamber	3617	20

- - -

CERTIFICATE OF REPORTERS

We, KATHERINE POWELL SULLIVAN and DEBRA L. PAS,
Official Reporters for the United States Court, Northern
District of California, hereby certify that the foregoing
proceedings in C 10-3561 WHA, **Oracle America, Inc., vs. Google,
Inc.**, were reported by us, certified shorthand reporters, and
were thereafter transcribed under our direction into
typewriting; that the foregoing is a full, complete and true
record of said proceedings at the time of filing.

/s/ Katherine Powell Sullivan

Katherine Powell Sullivan, CSR #5812, RPR, CRR
U.S. Court Reporter

/s/ Debra L. Pas

Debra L. Pas, CSR #11916, RMR CRR

Thursday, May 10, 2012